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Roads and Routeways in County Durham: 1530-1730

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Summary of Thesis Submitted for the Degree of PhD 2011

Roads and routeways, whether engineered or created ad hoc, create a dynamic element to the lives of those who use them and facilitate many features of day to day life. As such they have been a fundamental and powerfully ideological part of human existence. This thesis shows the causes and effects of road and transport network development in County Durham in the period from 1530 to 1730, and challenges the commonly made assertion that routes changed little from the Medieval period until the Industrial Revolution.

Drove routes, lead mining routes and the infrastructure of re-used Roman roads are viewed holistically and considered as individual and integrated networks over a broad time period. These networks are analysed and compared using quantitive spatial analysis and GIS (Geographic Information System) techniques to examine which factors were pivotal in the creation of each road or routeway system. In addition, factors such as consumption patterns, shifts in population and funding mechanisms are drawn upon to examine roads as artefacts and cultural markers. Thus the roads and the roadscapes are used to study the identities of those who used them. A trial of dating techniques with which to date roads, with the use of optically stimulated luminescence (OSL) infra-red stimulated luminescence (IRSL) and radiocarbon dating, was also completed.

It will be shown that different factors influenced the placement of the different routes. Distance and slope being of prime importance for the Roman network; land use type, distance and visibility for the drove routes and land use type and slope for the lead routes. These routes formed part of an holistic network which, through using different network types for different tasks and purposes, gave strength to the overall transport system of County Durham. Thus the network helped to drive new aspirations and patterns of consumption, facilitated the exchange of information and fashions and helped to provide new sources of wealth. The connectivity that the roads and routeways brought created a county with greater geographical, cultural and social knowledge that stimulated an increase in class consciousness, in so doing they also provided the means by which these new ideals and ideas could be expressed.

Roads and Routeways in County Durham: 1530-1730

Volume I

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Department of Archaeology, University of Durham

Thesis Submitted for the Degree of Ph.D.
2011

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May all your roads take you to paradise.

Acronyms and Abbreviations

AMS: Accelerator Mass Spectroscopy

ASDU: Archaeological Services Durham University

BP: Before Present (1950)

C: Celsius

DEM: Digital Elevation Model

DTM: Digital Terrain Model

ESRI: Economic and Social Research Institute

GIS: Geographical Information System

GPS: Global Positioning System

Gy: Gray

HCl: Hydrochloric Acid

HER: Historic Environment Record

IRSL: Infra-Red Stimulated Luminescence

MAGIC: Multi-Agency Geographic Information for the Countryside

NaOH: Sodium Hydroxide

NERRF: North-East Regional Research Framework

NMR: National Monuments Record

OED: Oxford English Dictionary

OSL: Optically Stimulated Luminescence

RCAHMS: Royal Commission on the Ancient and Historic Monuments of Scotland

RCHME: Royal Commission on the Historical Monuments of England

SMR: Sites and Monuments Record

Sr: Strontium

TIF: Tagged Image Format

TIN: Triangular Irregular Network

TL: Thermoluminescence

Y: Yttrium

Additional Notes

Throughout this thesis the north east region is taken to be that of north east England comprising Cleveland, County Durham, Northumberland and North Yorkshire.

The dates for the periods discussed are as defined by Durham County Council and are out lined in chapter 1.

A time line of selected events in the history of roads and routeways is provided in volume II.

A selected glossary can be found in Volume II. Where possible regional variations of spellings have been maintained for example in the use of the word 'waggon' the Northumbrian variation is used.

Subdivisions are used throughout to create a comprehensive contents list in order to allow the reader to locate sections with ease.

Figures, maps, tables, graphs and appendices are in a separate volume, volume II, to facilitate consultation.

Statement of copyright:

The copyright of this thesis rests with the author. No quotation from it should be published without their prior written consent and information derived from it should be acknowledged.

"Roads go on
While we forget, and are
Forgotten like a star
That shoots and is gone."
Edward Thomas 1910

Roads and Routeways in County Durham: 1530-1730

1 Introduction

1.1 Roads: Beyond Functionality; The Power and the People

Roads are an underused source of information in the archaeological world, often discounted as being difficult to date and interpret. Indeed, in everyday life roads are often taken for granted and yet they are the very means by which society is able to function. Hindle explains this paucity of research as being due to the lack of new road building that was carried out in the Medieval and early Post Medieval period, thereby making it difficult to establish routes and the dates of their initial phase (Hindle 1998a: 6). Earlier, Flower had hypothesised that early roads made and maintained themselves through unregulated local effort as they grew from customary lines of travel (Flower 1915: xxv; Grenville 1997).

The course that a road or routeway takes between points is controlled by a number of factors. Those generally seen to be the most significant[1] can be broadly defined as topography, engineering capabilities and traffic. The topography of an area will nearly always help to determine which routes are possible. The landscape between an origin and a destination may have obstacles, such as rivers and steep terrain, that have

[1] From a purely functional and engineering perspective

to be avoided or that need engineering solutions. Sufficient engineering proficiency can help to make routes more direct as bridges can be built, tunnels dug and clearance of ground carried out. The level of engineering required is dependent not only on the topography but also on the type of traffic for which a road is intended. Wheeled vehicles, for example, need a very different road and route from pack animals or pedestrians, requiring greater width and more moderate gradients and bends. The surface too needs a much higher level of engineering to provide an even surface that is durable against continued wear in the same, often limited areas (Davies 2002: 16). The level of engineering available depended on historical circumstances, although technology often developed in response to historical imperatives. For example if a route is used infrequently then expensive engineering solutions, which may need much maintenance, are not the best solution and a longer, but less financially costly, route may be chosen.

The three factors most commonly studied in relation to roads, topography, engineering capabilities and traffic, whilst significant, are not the only aspects that have to be considered. Additional features affecting where a road actually went rather than where it could go include land ownership, land use, politics, custom, cost, maintenance, frequency of use, season, time and purpose. To examine all or most of these intertwining factors is to set the road in a social context as well as an economic one, this thesis therefore will demonstrate the validity of the social context explored through day-to-day occupation and social identity as well as through the practical considerations of usage. In order to redress the balance of the economic and functional against the social imperatives and responses to roads and routeways these factors will be explored and contrasted throughout the thesis where pertinent to the particular road or route type, as detailed in the chapter précis.

1.2 Defining the Study: Scope and Timeliness

This thesis posits that a road is a social construct as much as a functional-economic one and it will show the causes and effects of road and transport network development in County Durham in the period from 1530 to 1730. The commonly made assertion that routes changed little from the Medieval period until the Industrial Revolution will be refuted. Route types including drove routes, lead[2] mining routes and the infrastructure of re-used Roman roads are viewed holistically and considered as individual and integrated networks over a broad time period, from 1530 to 1730. These networks, which were developed for different purposes, are analysed and compared using quantitive spatial analysis[3] to examine which factors were pivotal in the creation of each road or routeway system. In addition, factors such as consumption patterns, shifts in population and funding mechanisms are drawn upon to examine roads as artefacts and cultural markers.

The analyses will challenge Hindle's criticism that, *"Writers on this topic have largely confined themselves to looking at the travellers, road maintenance, the means and safety of travel and the state of the road."* (Hindle 1998a: 5).

The timeliness of this research is highlighted by the findings of the north-east Regional Research Framework for the Historic Environment (NERRF), which emphasised the poor understanding of the late Medieval and early Post Medieval road network. The Geographic Information System (GIS) mapping which is used in this thesis provides a much needed synthesis of surviving field evidence (Petts and Gerrard 2006: 79, 178).

Key themes of research and research priorities noted by the NERRF include areas that will be considered by this thesis and these are:

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[2] For clarity, throughout this thesis 'lead' is used to refer to the metal with the elemental symbol Pb.
[3] Using Microsoft Excel and ESRI Geographic Information Systems software ArcView and ArcGIS.

- Patterns of Consumption (*ibid*: 181), aspects of which will be examined with reference to the changing requirements placed upon the various networks of roads and routeways.

- The North Pennine Dales (*ibid*: 181) which were the centre of lead mining in County Durham. Selected lead routes used by this extractive industry will be mapped and assessed. The use of the routes as part of the social infrastructure and their unique liminal placement in relation to the upland agriculture are also to be appraised.

- Anglo-Scottish Identities (*ibid*: 182) will be explored within the chapter pertaining to the drove routes that came through County Durham from Scotland, as will the distinct identities of those involved in the cattle trade.

- Cultural and Ethnic Identities (*ibid*: 182). The points of exploration raised within the broad and complex area of cultural and ethnic identity that have been highlighted by the NERRF include those questions brought about through the study of the identities of professions. These questions include:

    i. *"Did these lead to the creation of a distinct suite of material culture, architecture or patterns of consumption?*
    ii. *Does the Post Medieval period see a rise in class consciousness?*
    iii. *How is this reflected in archaeology and architecture?"* (*ibid*: 182).

The professions within this thesis are primarily those associated with droving and the lead industry. The routes these professions used were forged and driven by these identities, and the identities were formed in part through the use of a specific network type. The opportunity to use the route and the routewayscape as an indicator of identity, in these contexts, will be examined. In this thesis the social identity of individuals and within communities is examined as an aspect of class consciousness.

1.2.1 The Study Area: County Durham

The area of County Durham, for the purposes of this work, is defined using the current, county boundaries and excludes the unitary authorities of Stockton, Hartlepool and Darlington. Distinct geographical areas are hard to define since boundaries move throughout time. Parishes, counties, land ownership and administrative areas can shift and overlap (Weatherill 1996: 45). There is also the issue of attributing undue historical weight to regions and areas. The terms "north east" and "County Durham" are both readily and frequently defined and used as significant indicators of 'regional identity' to today's society and there is a preconception that these artificial boundaries were significant to the past communities and people (Simpson 2002: 5; Everitt 1979: 79). Whilst the modern boundary is an arbitrary demarcation of the county it represents, County Durham, in both modern and historical terms as the core of this region, has remained largely unchanged. The boundary selected encompasses key areas of the study of this thesis such as zones of lead industry, major market towns and a rich variety of topography and land types; it can therefore be seen as a representative sample without attributing undue historic importance to boundaries.

County Durham has been chosen as the area of study because the survival of the archaeological sites associated with roads and routeways, such as the lead mines and their associated workings, is considerable. County Durham also provides a more varied set of network types within one geographical area than might be found elsewhere due to the diverse nature of the industrial and economic activities that took place within the limits of the research area between 1530 and 1730 (McCord and Thompson 1998).

Contrary to much popular thought, considerable effort was put into the creation of canals and waterways to link rivers in the Medieval period in England, long before to the eighteenth century boom in canal-building. Religious houses often constructed extensive canals in order to aid the transport of building stone and goods to their precincts. These waterways supplemented the Medieval land routes (Henderson 1991: 124). County Durham has its own particular transport history and development due to its early industrialisation and the fact that it did not rely on the creation of canals to serve these bourgeoning industries as in other places of early industrialisation such as the West Midlands.

The early industrial growth of the lead (and latterly the coal) industry in the county and the late development of the turnpikes also means that the assertion that, *"…the transport needs of the pre-industrial English economy and society did not change fundamentally between the middle ages and the seventeenth and early eighteenth centuries."* (Harrison 2004: 7), can be investigated within one defined area.

Work by Roberts *et al.* 2010 covers the drove routes of Northumberland in detail but County Durham forms part of the under researched stretch of the drove routes from the Scottish boarders to North Yorkshire, almost ignored in books such as Addison 1980.

The roads and routeways being examined, by necessity, lead into and out of other geographical regions. Chapter 4 is a case in point; as the re-used Roman roads in County Durham are part of a national network. The primary focus throughout this thesis, especially with regard to the mapping, however, remains County Durham. Figure 1 is provided for general reference regarding the settlements in County Durham.

1.2.2 Time Frame: 1530-1730

The time period is framed by the Dissolution of the monastic houses and the English Reformation which has its roots in the early sixteenth century, as its starting point and the introduction of the turnpike road to the area in the 1740s, as its end point, this being a major change in the organisation of roads. This period and place provide a contextualized framework for the study of roads and routeways as networks whilst dynamic changes in land ownership, legislation and consumption were occurring throughout the county and the country. It also provides the opportunity to investigate the changing transport networks through this period of economic change, with its variations in population and increase in consumption.

Although the time period is framed by *events,* this thesis, explores and emphasises *long term* changes and uses of the network, following the approach commended by Braudel (2002), who espoused the 'longue durée' timescale in his series on Civilisation and Capitalism. As such *"…time is not respected in its chronological continuity, but used as a means of observation."* (Braudel 2002: 23). This approach is particularly apposite for the study of the roads and routeways as, whilst discrete events affected them, to study them within the constraints of a narrowly defined episode is to ignore the very fact that they have their roots in the continuous flow of time and of the movement of people.

In County Durham the continuous re-use and development of the Roman road network after the Roman period formed the road network used in the period 1530-1730. Taking into account the longue durée approach chapter 4 therefore provides a context for the Roman road network itself, as well as considering its Post Roman employment and development in the Anglo-Saxon period through to its re-use and modification in the sixteenth to eighteenth centuries.

The expansion of the droving trade in the period 1530-1730 reflected changes in the economy and the shifts in, as well as the decline and growth of, the population and political changes during this period. Their survival beyond the period of study is provided, again to demonstrate the idea that the routes themselves are not uniquely bound by the period prescribed by this work.

For the lead routes, shifts in ownership of coal and lead mining rights during the Post Reformation period (in particular following redistribution of land and mineral rights after the Dissolution of the monasteries) brought about the expansion of industry, a transfer in wealth and investment in infrastructure. Changes in the funding and maintenance of the various networks are reflected in the legislation of the period, for example, the Statute of Bridges 1531, as the traditionally pious funding linked to the old religious regime and establishments ceased to exist.

The lead routes can be seen to represent the antithesis of the other roads and routes, which were used over a substantially longer period than that covered by this thesis, because for the most part, their creation and use was bounded by the success of the lead mining industry or indeed in some cases the productivity and profitability of a particular mine.

In employing a broad scale approach in both time and space this thesis aims to respond to the criticism that *"…most works on road transport and internal trade in pre-industrial England have tended to examine different periods in isolation."* (Harrison 2004: 222).

In this thesis the time frames for the periods are those used by Durham County Council Archaeology Section and are:

- Roman AD 70 - 410
- Anglo-Saxon 410 - 1066
- Medieval 1066 - 1540
- Post Medieval 1540 - 1899

1.3 Précis of Chapters

The chapters contained within this thesis are introduced and contextualised below. Each of the route based chapters (numbers 4, 5, and 6) will address each transport system in question in terms of:

- the purpose and rationale behind its creation and use;
- the transport used and any additional requirements imposed by any changes over time;
- their creation, whether the routes were designed or created ad hoc or whether a pre-existing route that was adopted;
- their physical structure and maintenance;
- their effect on the local environs, society and economy;
- the road and the roadscape as extant and buried artefacts.

The factors of custom, cost, maintenance, frequency of use, season and purpose are discussed as part of the narrative for each chapter. For each chapter the functional factors examined through the GIS analysis include slope and distance and least cost distance analysis.

1.3.1 Chapter 2: Conceptual Approaches to the Study of Roads

As they form such a fundamental part of life, roads have attracted a wide and varied literature, chapter 2, appraises how the roads and routeways have been studied, framed by specific periods in time, such as the turn of the twentieth century when ‘motoring’ galvanised writers to investigate the heritage of the routes that were then increasing in use, and also framed by different approaches, such as that of landscape archaeology where roads are viewed as parts of a wider landscape. The approaches are critically analysed and the elements that have been chosen to form the conceptual foundations of this thesis are discussed.

1.3.2 Chapter 3: Methodology

The roads and routeways themselves, however, only form part of the overall transport network. A complex infrastructure around the roads, just as we have today, was often necessary and commonly well established. Coaching inns, fields for drovers to rest their cattle, stabling sheds for pack animals, bridges and blacksmiths' shops and forges all formed part of this system. This chapter discusses how this data was obtained and how it was deployed in order to create the mapping of the networks upon which the spatial analysis was performed.

This thesis relies on a number of very different techniques including computer based analysis using the ESRI[4] Geographic Information System ArcView 3.3 and Microsoft Excel as a data manipulation and presentation tool, the consultation of historic documents and maps, the use of modern maps and aerial photographs and the testing of the optically stimulated luminescence dating technique (OSL). The methodology will cover in detail the nature and uses of these resources and approaches which have been selected in order to be able to create a holistic and wide ranging (in both time and space) examination of the transport networks in County Durham.

The issue of dating the initial phase of a road or a routeway will also be examined. An assessment of suitable dating techniques such as optically stimulated luminescence and radiocarbon dating was carried out through the excavation of a section of Roman road for which a construction date has been established via documentary evidence. The details of the excavation and the post excavation work are presented in this chapter.

1.3.3 Chapter 4: The Re-Use of the Roman Road Network

The factors influencing the placement of the original Roman network and the reasons for their continued use are the core of this chapter. The GIS mapping of these routes

[4] ESRI is the 'Economic and Social Research Institute' which specialises in the development of GIS software.

concentrates on the Roman routes which were retained as parts of later transport networks to enable the comparison of slope and distance with the other route types; for example their possible similarities to turnpikes and waggon ways and the distinction between this network and the drove and lead routes.

In chapter 4 the reused Roman roads are examined in relation to their slope and gradient. The concept of 'powered landscapes' (Spencer-Wood and Baugher 2010) as a reason both for the creation and maintenance of the network will be considered using the notion of the ideology of appropriation.

1.3.4 Chapter 5: Drove Routes

This chapter concentrates on the major droving networks crossing County Durham which were forged through the landscape to steer cattle from Scotland to the large cattle markets in London and the south. Drove routes will be examined against the unstable background of changing legislation regarding trade with Scotland and the economic and political context of the period.

In addition to least cost analysis, the investigation into the social constructs of the drove routes includes viewshed analysis. This plots what is visible from defined viewpoints, is used to investigate the visibility of the market towns as the drove routes approach them and to explore the possibility that these routes followed and were created by the drovers following channels of visibility. The drove routes are also studied taking into account key factors such as land use for the provision of grazing for the cattle.

The routes are discussed within the context of the professional identity of the drovers and the concept of a gendered power dynamics as part of the constructed landscape explored.

1.3.5 Chapter 6: Lead Routes

This chapter investigates the use of these specific industrial routes, created with ostensibly economic imperatives. Additional dynamics of the time and place will be explored, including the examination of land use patterns in this liminal agricultural landscape and the requirements of the routes bounded by the use of pack horses. The use of pack animals and then waggon ways in the coal industry will be compared, as will the effects of the land and mineral rights in the Post Reformation period.

Chapter 6 analyses the placement of the lead routes in terms of land use and looks at fiscal influences such as the lead industry's approach to the funding of local transport networks to improve their profits. They will be shown to have been constrained by land use, for workers housing and for farming

The hypothesis that the changing landscape that was created by the expanding lead industry and viewed by the lead workers with their use of the routes strengthened their occupational identities which transcended both gender and age is investigated.

1.3.6 Chapter 7: Roads, Routeways; Architecture and Lifestyles

This chapter examines the broadscale effects of roads and routeways in the north east region, for example the ways in which the road and routeways helped to drive new aspirations and aspects of patterns of consumption, facilitated the exchange of information and fashions and helped to provide new sources of wealth. It will examine vernacular and gentry architecture in some detail and propose that the improved network of roads and carriers was a major motor driving change.

In this chapter the criticism that, *"Writers on this topic have largely confined themselves to looking at the travellers, road maintenance, the means and safety of travel and the state of the road."* (Hindle 1998a: 5) is challenged as the roads and routeways investigated for this thesis are used holistically as artefacts, cultural markers and as mechanisms for change, thus addressing key themes of research and research priorities noted by the North East Regional Research Framework (NERRF) (Petts and Gerrard 2006).

The coherence of the infrastructure system of County Durham is evaluated, with the notion that discreet networks created a functioning and conceptually integrated network.

1.4 Defining Terms: What is a Road?

In defining the terms used within this thesis it is apposite to consider the question: 'what is a road'? The reused Roman roads, examined in chapter 4, will be shown to become predominantly cartways and highways. The drove routes, studied in chapter 5, were major routes, often to market towns but they were unmetalled, used by people on foot and livestock not carts. The lead routes, explored in chapter 6, can be classified as routeways and packways.

1.4.1 Roads

The word 'road' is defined by the Oxford English Dictionary as, *"An ordinary line of communication used by persons passing between different places, usually one wide enough to admit of the passage of vehicles as well as of horses or travellers on foot.*" (OED 2010). It is derived from the Old English *'rád'* meaning to ride or a journey on horse back and took on its present meaning[5] in the late fifteenth century (*ibid*). Shakespeare's work provides examples of this changing use of the word, being used to describe ships riding at anchor, to ride a horse and also in the increasingly modern sense to portray progress or a course of movement (Gregory 1931: 12-3).

English Heritage in its Monument Protection Programme describes a road as *"… an artificial way having a constructed bearing surface, providing a means of communication suitable for wheeled traffic, between places and features."* (English

[5] In written text although it may have been used verbally for much longer.

Heritage in Morriss 2005: 11). This definition adds the requirement for the road to be metalled, that is for it to have at least one layer of purposefully deposited material to provide support for loads, and to create an even surface and to protect the sub-structure (Davies 2006: 75-7). There are many different techniques for metalling a road's surface. These include stone, gravel, cobbles, tarmac and concrete. This definition, therefore, excludes many transport networks, which did not have metalled surfaces, such as drovers' routes and packhorse ways.

The blurring of the meanings between roads, tracks, routes and routeways is significant. This thesis considers both roads and routeways and the distinction between them is important. Therefore 'roads' refers to surfaced links, and 'routeways' refers to a regular line of travel from one place to another without a continuously engineered surface.

1.4.2 Street

Other generic names for routes include 'street' and 'way'. Street originates from the Latin *strata* from the phrase '*via strata'* meaning paved way. During the Anglo-Saxon period this became '*stræt'* and way was used to describe any other route or road. Of all the terms used, only street has its origins in referring to a deliberately engineered course. The most frequent modern use of the term street has lost this imperative and usually refers to routes within towns. It denotes places of location and activity, whilst the word road has come to be used as the nomenclature signalling routes between these places (Room 1992: 1; Morriss 2005: 11). It is possible to view other types of urban thoroughfares as sub-types of the street, these include: alleys, avenues, walks, drives, boulevards and colonnades[6]. These can often be seen to signify certain types of street furniture, spacing or buildings but all share the defining features of a street in that, as well as their individual architectural identities, they all have both economic and social functions (Kostof 1992: 189).

[6] This list is not exhaustive.

1.4.3 Way

Way is derived from the Old English '*weg'* which had a broad interpretation related to the use of the route.[7] These meanings included 'to journey', 'to carry' and 'to move'. In the Medieval period the word 'way' became incorporated into use with other terms creating, for example, by-way, highway, passageway and routeway (Morriss 2005: 10; OED 2010).

1.4.4 Usage

By the 1700s roads were broadly classified in three ways which correspond with fourteenth century practice (Flower 1923: xv). Hawkins defines them as:

> *"1. A Footway (…)*
> *2. A Pack or Prime-way, which is both a horse and footway (…).*
> *3. A Cart-way, which contains the other two and also a cart-way(…)"*
> (Hawkins 1724-26: 200).

Legal definitions included *'via regia'* and *'via communis'* which were available for open use and *'communis strata'* which were private roads or belonged to a person, town or city. It is from this use that 'strata' came to be used as a route in a town rather than open country (Flower 1923: xv). More generally the term highway was used to describe major routes.

> *"…any one of the said ways, which is common to all the King's people, whether it lead directly to a Market Town or only from Town to Town may properly be called a Highway*

[7] The Latin *via* was regarded as a possible root of way but it is now generally accepted, however, that it originates from the Old English although the sense development is likely to have been influenced by the Latin (OED 2010).

and such Cartway may be called the King's Highway…"
(Hawkins 1724-26).

The variety of the terminology used demonstrates the ever developing nature of roads and routeways for specific purposes which grew and changed over time.

1.5 Summary

Roads and routeways, whether engineered or created ad hoc, add a dynamic element to the lives of those who use them and facilitate many features of day to day life, for example they allow movement and trade, can determine economic and military success and can represent both freedom and oppression. As such they have been a fundamental and powerfully ideological part of human existence.

This thesis shows the causes and effects of road and transport network development in County Durham using the examples of the re-used Roman roads, the drove routes and the lead routes in the period from 1530 to 1730. It also challenges the commonly made assertion that routes changed little from the Medieval period until the Industrial Revolution. Using a broad time scale and large area of study it will present the roads and routes as artefacts and cultural markers, placing roads in their social context and contextualising their economic and functional imperatives.

"The Roads of England have attracted a considerable literature, and it might seem difficult to say anything very new…" (Hoskins 1955: 233)

2 Conceptual Approaches

In order to study roads a variety of approaches have been used. These include landscape studies, GIS analysis and geographical and historical methodologies, all of which have come to form the body of knowledge regarding roads available to us today. This chapter shows the methodologies and the approaches that have been used. They are critiqued and the elements that have been chosen to form the conceptual foundations of this thesis, which investigates both the functional and the social imperatives, are presented.

2.1 Roads and Routeways: Function and Ideology

Roads and routeways are ordinarily seen as fundamentally functional. Studies of Roman roads have often concentrated on their military and governmental function and purpose for example Margary 1973; Bagshawe 1994; Davies 2002. Carrier and coach routes are usually analysed with regard to their commercial functions and their influence on and by productivity and trade (Chartres 1977b; Gerhold 1996b). These approaches focus on characteristics most readily revealed by the historical and archaeological record such as place names, hedgerow alignments, road names (e.g. Salter's Way), historical maps and archaeological finds. For example, in the case of the study of the development of the Roman road system in the north west of England the archaeological finds of samian ware pottery were used as an indicator of the location of Roman routes in addition to the more usually used finds of military metal work and coins (Wild 2002: 268).

In addition to their functional nature the roads can frequently have unique, symbolic and social meanings (Witcher 1997). They affect our view of our environment and landscape because as we travel along them our views of our surroundings are dictated by the route of the road[8]. So too are our views to and of roads; in an urban and semi-rural environment it can be hard to find a vista that does not include the view of at least one other road. Roads can also be seen to shape emotions, for example plans for the construction of a relief road around Durham have raised many issues including those of views from and to the historic centre of the city.

> *"The road would run close to the centre of Durham City, passing on concrete stilts half a mile north of the Cathedral and in the process vandalising one of the greatest panoramas of ecclesiastical architecture in the world."* (Clark 2008)

The strong language used clearly demonstrates the effect that even a proposed road can have on people and communities. Today people campaign for and against their construction, re-routing and use (Campaign For Better Transport 2008; Clark 2008). So, since the Romans created their road network without reference to the local communities, it may be apposite to question how the local population viewed their construction[9] (Witcher 1997).

To ignore emotional and ideological power of roads and routeways is to reduce them to the solely functional and yet to ignore the functional and economic imperatives of roads is to remove major aspects of their value and raison d'etre. This thesis therefore uses both the analysis of the functional and the emotive in order to demonstrate the validity of the social and ideological contexts explored through day-to-day occupation and use of the roads and routeways.

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[8] For many people their views of landscape come only from what they see from a car window.
[9] This will be discussed further in chapter 4.

2.2 Previous Approaches to the Study of Roads

Whilst roads, as discussed above, have many different imperatives to their existence for example, economic, ideological, technological and social, most studies have concentrated on economics and engineering. Here, different impetuses for the study of roads, such as the increasing use of motor vehicles, are considered alongside approaches which are used in the broader scope of the roadscape, such as landscape archaeology. Current research, using technologies such as satellite imagery and GIS, is presented in addition in order to highlight that, whilst the approaches to the study of roads has developed the focus of the use of these 'new' techniques is still predominantly to study the functional aspects of roads. This thesis therefore offers a new perspective to the study of roads by employing a variety of approaches to examine social identities as well as practical and economic considerations.

2.2.1 Research in the Early Twentieth Century

The beginning of the twentieth century brought with it many changes, not least the updating of the Motor Car Act in 1903, which was changed to include new categories of vehicles, powered by internal combustion engine or steam power. Vehicles were also now required to be registered and the drivers licensed (Davies 2006: 182). 1923 saw the number of registered cars in Britain pass one million (*ibid*: 183). Cars brought with them a sense of freedom, excitement and adventure, which coupled with a post-World War I optimism, made them potent symbols of a new era (Roberts 1956: 57).

Research into roads and their uses, past and present, and publications about them, their uses and construction proliferated in the early twentieth century. These publications included broad ranging works looking at the development of the road system like the book, 'The Story of the Road, from the Beginning Down to A.D. 1931', which ambitiously covers both use and construction of roads around the world. Gregory considers geography, history and archaeology as being combined into a coherent, 'readable' past through the analysis of a system of 'living roads' (Gregory

1931: 4). This approach is commended by Peacock in his review entitled 'The Epic of the Road' as he observes:

> *"Ancient monumental architecture usually represents work of a special nature undertaken by autocratic rulers in times of prosperity and abundant slave labour; roads, on the other hand, indicate much more nearly the everyday business of the people who made and used them…"* (Peacock 1932: 695)

It is by following this premise of the 'living road' and by looking at the 'everyday business of those that created and used them' that this thesis looks at the historical road-using professions which include those associated with the droving and lead mining industries with the proposal that the roads were forged and driven by these occupational identities, and that in turn identities were formed, in part, through the use of their specific network type.

'The Roads of England' (Anderson 1932) was written to appeal to the wider public who were making increasing use of the road network, and whom Anderson saw as 'the inheritors of the tradition of Chaucer's pilgrims' (C 1932: 155). Other works concentrated on the methods and materials of ancient road construction, for example the book by Forbes, 'Notes on the History of Ancient Roads and their Construction', which comprehensively covers many different road types, from the ridgeways in England to the roads of other European countries through to the roads of Egypt, Mesopotamia and the Indus valley (Forbes 1934).

Other publications were much more geographically confined, a case in point being 'From Trackway to Turnpike: an Illustration from East Devon' which concentrates solely on the area from Lyme Regis to Okehampton and Brampton to Newton Abbot (Sheldon 1928: 3). An article by Scott Thomson, however, is temporally defined, looking solely at the Roads in England and Wales in 1603 using a manuscript volume from the early part of 1603 which lists seventeen highways to London (Scott Thompson 1918: 235). Over a broader but still defined period 'The Road System of Medieval England' by Stenton 1936 is an article still referred to with regard to Medieval transport and is cited, for example, by Dyer 1989 as it is an example of a broad scale study of English roads. An appreciation of the opportunities and constraints of using different scales of time and study areas as seen in these books which provided valuable context for the defining of a suitable broad scale time and study area for this thesis.

Parkes in her book, 'Travel in England in the Seventeenth Century' takes a different approach, that of looking at the act of travelling rather than the roads themselves, drawing comparisons between the advent of the post and carriage routes in the seventeenth century and the dawning of a new age of trains and 'motors' (Parkes 1925: xvi). The line "*A few years, may-be, and we shall fly to the ends of the Earth…*" (Parkes 1925: xvi) reminds us again how travel has changed so fundamentally since the 1920s. As those in the early part of the twentieth century looked back to roads of bygone eras, so too do we look back to times gone by. It is interesting to note that 'The Highways and Byways' series published up to the mid 1940s and including titles such as 'The Highways and Byways of Northumbria' (Graham 1920) is currently enjoying a "*…delightfully nostalgic reissue…*" (Telegraph 2009: 16) in the form of an edited volume, drawing together selections from the series (Milner 2009).

All the books discussed above display a coherence of concentrated narrative in order to provide evocative views of the roads of the past and it is this passion and interest in roads which this thesis aims to develop.

2.2.2 A New Wave of Research: GIS[10] and Remote Sensing

As an aspect of landscape, roads may benefit greatly from the application of GIS techniques. The first GIS was originally developed in the 1960s in Canada where, by the 1970s the Canada Geographic Information System (CGIS) could be used to store ecological information regarding forest extents and soil types. These coverage maps were not purely cartographic as they could be displayed simultaneously and used to create new overlays of data resulting from the simple mathematical manipulations (Lock and Harris 1992: 89). The functions that GIS can perform have been continually developed and refined but it is still the ability to transform and manipulate data, for example in the production of viewsheds, that truly distinguishes it from other databases and makes GIS software such a versatile tool for this thesis and many other works. Its use in the study of roads has been significant and the following examples reflect the wide variety of work that has been undertaken in relation to roads and routeways using GIS and remote sensing.

GIS has been used in combination with other techniques to look at routeways and pathways in a variety of ways. Bellavia (2002) in his study looked at ways of using GIS in combination with Digital Elevation Models (DEM) and hydrological modelling to find "natural pathways" between prehistoric ritual sites. The mapping of these natural pathways uses the premise that natural topography shapes the formation of tracks and that these preferred routes will be of the lowest 'cost', that is those of the lowest slope, theoretically involving the lowest expenditure of energy (Bellavia 2002: 5, 9).

Siart, Eitel and Panagiotopoulos (2008) in their study of Mount Ida, Crete used GIS and DEM in combination with other remote sensing techniques, including the use of satellite imagery from Quickbird**,** a high-resolution commercial satellite, owned by

[10] GIS techniques will be discussed in detail in chapter 3, but in this present chapter, the use of such approaches is examined.

DigitalGlobe and launched in 2001[11]. This imagery combines the advantages of the coverage of large areas and those of high resolution aerial photography. Here the aim was to assess the techniques and their ability to provide a multi-method and multi-factor approach to the mapping and study of settlement patterns and the Bronze Age communication paths between these settlements and other archaeological sites (Siart *et al.* 2008: 1). The results of their search for support for the "Minoan Highway", hypothesised by Evans 1929, proved to be mixed, matching in some areas and taking alternate routes in others (*ibid*: 7). The authors defined the potential limitations of their modelling and concede that the aspect of journey time may be a factor as noted by Ebert in his paper on mistakes in predictive modelling (*ibid*: 7; Ebert 2000: 130). This idea of the 'least time route' is examined by Rees in a study of footpaths in Welsh mountains and found not to be the defining factor in the placement of these footpaths (Rees 2004: 203). This aspect of routeways is pertinent to the study of the lead routes in chapter 6 where the terrain is similar to that in the work by Rees.

Drove routes often present themselves in the landscape as hollow ways due to the large amount of animal traffic and so it is interesting to note which techniques are available and have been used for similar route types in different locations. A study of the ancient road networks of Mesopotamia by Ur uses satellite data from the now declassified US military CORONA satellite program. The roads in question present themselves as hollow ways; sunken routes created through high level use over a long period of time, and are difficult to see through field survey and even with traditional aerial photography. The land type, vegetation, survival of the routes, wide coverage and the high resolution make the CORONA satellite data ideal for the large scale mapping of these routes which were then spatially integrated into a GIS along with geomorphogical and environmental data (Ur 2003: 102-7). Unlike the broad coverage of the commercial QuickBird the coverage for CORONA was determined by the US military and as such there are many images available for countries such as Syria and

[11] The limitations of this imagery in the context of the Mediterranean are discussed.

Russia and very limited coverage for Britain, therefore making it un-usable for this thesis.

Sometimes it is necessary to question our attitude and assumptions as to what constitutes a road or routeway. Differential GPS (Global Positioning System) is another technique, used in conjunction with GIS, which as been used in the search to find ancient roads. Fenwick, in her investigation of the ancient roads of the Amarna Plain, Egypt, uses three dimensional co-ordinates collected from field work with a GPS unit to create a Digital Elevation Model (DEM). In this instance the study area was confined enough, although still large, to carry out the detailed three dimensional modelling which revealed “roads” that are routeways that have been cleared of stones and debris (Fenwick 2004: 880-1). This creation of a route through clearance so that the route is an absence of evidence highlights one of the difficulties in dating roads and routeways with methods that are not morphological. Chapter 3 continues this discussion and presents the dating investigations which form part of this thesis.

2.3 The Landscape Perspectives

This study seeks to put roads into their social context. The study of the landscape provides the physical component of this contextualisation of the road and routewayscape through the study of the landscape which has been altered by human interaction, in other words a ‘cultural landscape’. Different landscape approaches and the development of landscape archaeology have been fundamental to the creation of an academic debate which allows broad scale works, both temporally and spatially, to be examined.

Work on roads and routeways within landscape archaeology has predominantly been generalised overviews of type, indicators[12] and function (Muir 2000: 93). The exceptions to this approach include the work by Hooke on transhumance routes and

[12] For example milestones and toll houses.

Anglo-Saxon landscapes (Hooke 1977; 1998) and example study areas such as south east Somerset highlighted in Aston 1997.

Cultural landscapes are a complex record of a people's interaction with surroundings. To investigate landscapes, therefore, requires the study of different aspects of the landscape: those used in everyday life, including population centres, infrastructures and field systems plus those features (natural and artificial) that may have been used in more specialised ways or been infused with social or religious meaning (Crumley and Marquardt 1990: 73).

Viewed chronologically, a general change in both landscape theories and the ways in which they are studied can be clearly seen. Studies before processual approaches were adopted concentrated on the history of landscape sites through excavation and documentary research. The processual approach reconstructed the environment and the site's 'resource catchment area' through increasing use of interdisciplinary methods combining geology, geography, and increasingly, scientific archaeological techniques. The post-processual period has brought yet more interpretations, the study of the unaltered landscape as an important part in understanding the past, the study of symbolic significance associated with the countryside and landscape phenomenology. The use of GIS programs has facilitated many of these developments, as have increasingly refined field walking, excavation and analysis techniques. The modifications in both theory and method are not simple, because, not only do theories overlap in both time and ideas but also methods can be used interchangeably for different purposes.

Landscape archaeology is an approach for studying past populations in the wider[13] social and physical environments that they inhabited with an explicit emphasis on the study of the relationships between archaeological data and the surrounding environment. It is sometimes seen as an approach that does not have to be combined

[13] Usually, but not restricted to, regional studies.

with any specific theoretical point of reference as it can be an extremely empirical collection and display of data about any particular landscape (Lucas 2001: 128; Thomas 1993: 20) . It can be argued, however, that there are several clearly identifiable theoretical approaches to landscape archaeology.

2.3.1 The Historical Landscape Approach

This thesis draws widely on the use of historical records. In chapter 7, for example, the records associated with the Bowes family are used to consider aspects of consumption being driven by the roads and routeways of County Durham. The details of the records and resources used are presented in chapter 3, section 3.4.

There are many means available to the archaeologist for the collection of data for the study of landscapes, some seen as ‘classically archaeological’ (for instance field walking and excavation) but many are interdisciplinary, drawing material and techniques from historical and geological backgrounds. Different methods and combinations of techniques are frequently used, the choice often being closely linked to theoretical concerns.

An historical approach was popular before the 1960s. Hoskins’ book ‘The Making of the English Landscape’ made the subject accessible to a wide audience in the mid 1950s. It emphasises factual information gained from records and is strongly biased towards the landscape from the Anglo-Saxon period onwards. The interpretations are factual interpretations of documents and other evidence (Aston 2000: 49, 115). The border between landscape archaeology and landscape history is fine and hard to define (Hoskins 1955: 14). Hoskins pioneered the use of the landscape to provide information about the past and he acknowledges that archaeologists ‘enlarged the time scale’ by looking at the more distant past. The divide between archaeology and history is therefore sometimes seen as period based (*ibid*: 11). The distinction is not that simple as increasingly the same techniques and similar methodologies are used across different disciplines (Johnson 1996; Orser 1996; Tarlow and West 1999; Johnson 2007; Tarlow 2007). Morriss, however, differentiates archaeology as being a strand within history where *"…the objective study of physical remains and the material culture of the past…"* is the principal impetus rather than documentary research (Morriss 2005: 11).

Hindle, a geographer, is the most prolific writer on roads in particular those from the Medieval period (for example Hindle 1976; 1978; Edwards and Hindle 1991; Hindle 1998a). As a geographer and an historian his approach is based around documents and maps; he does, however, also include landscape fieldwork and in so doing his work can clearly be seen as interdisciplinary.

The historical approach initiated the use of historical documentary resources for landscape study. Documents are very varied, as is their availability. One extremely valuable set of resources is the collection of old Ordnance Survey maps, the first editions, in a variety of scales, dating from c.1856 often indicating archaeological features. The first edition County Series 1:2,500 maps also give valuable information with regard to past land usage because they are accompanied by reference books detailing what each field was used for (Oliver 2005: 30-5).

Tithe, or payments in produce, can also give land use specifications and old field boundaries. Tithe maps were created in the twenty years following the Tithe Commutation Act of 1836. They were drawn up as part of the re-assessment of the tithes due from the secular population to the church and are not standardised in scale or the details recorded on them (Hindle 1988: 56-7). Sketch maps may also mark out historic buildings, old track ways and areas of old woodland. Names of fields plus the features detailed on these resources can also be an indication of former landscapes.

As an example, in the north west section of the parish of Greencroft (south of Consett, County Durham), there is a group of features containing the word ‘lund’ in their titles: Lund’s Lane, Lund’s House and Lund’s Lane End are all near Durhamhill Wood. It is possible that Lund is a derivation of the Old English ‘*Lundr*’ which is often associated with very old woodland (Muir 2000:13), and in this case this could conceivably be Durhamhill Wood which appears on the Tithe map, the 1st edition maps and survives today. Other documents can include Manorial Court Rolls, Lay Subsidies, Quarter Session Papers, Inquisitions Post Mortem and Probate Records. All of these can be useful but they must be analysed in a systematic and an archaeological way, such as through the consolidation into a database or GIS as with this thesis, and details regarding landscapes extracted.

2.3.2 The Functionalist Landscape Approach

The GIS component of this thesis, by looking at the value associated with different land types crossed by the drove and lead routes and the analysis of slope and the related real and theoretical distances uses a functionalistic approach to the roads and routeways in the landscape, but not in isolation. Functionalist approaches in general, which are usually categorised as processual, regard the landscape as a resource for the settlements and sites within it. The functionalist approach is sometimes linked with a ‘site catchment area’, i.e. a zone thought to have been associated with a site. The study of the landscape’s resources are therefore at the fore; water, arable land, grazing and forest are assessed as to their value, and landscape features such as high ground are studied in terms of their possible practical functions (Johnson 1999: 103). Environmental methods, encompassing geographical and geological disciplines investigate the natural formation of the landscape, analysing the influence this may have had on the archaeological record. These functionalist approaches can be combined with either processual or newer (post-processual), approaches such as natural place theory, which is an approach that studies the natural landscape with regard to its symbolic connotations rather than those of artificial features within the landscape (Bradley 2000: 33), or phenomenological archaeologies, as in the case of this thesis.

2.3.3 Phenomenology and GIS: Experience and Analysis

Currently GIS and phenomenological approaches are seen as separate entities, each with their own internal checks and critiques (Lake 2007: 1). In this thesis the two will be combined to use the 'human presence' and the concept of 'being-in-the-world' alongside GIS analysis to investigate the ideas of professional and gender identity. Through the use of GIS viewsheds the concept of lines of movement created by the drovers and manifest in the landscape as the drove routes are analysed[14].

A phenomenological study aims to uncover the conscious experiences of the humans who would have experienced the landscape. Tilley and Thomas are amongst those who study the landscape in this way. By walking along old route ways and along 'ritual' ways they study how physical experience can alter perceptions of the landscape (Thomas 1993; Tilley 1994; Johnson 1999: 114).

Within the field of, although not exclusive to, landscape archaeology GIS software has been used to increase the analytical and critical nature of the landscape studies. This use of GIS can be viewed in tandem as part of a wider shift from spatial archaeology towards landscape archaeology, as critical and qualitative methodologies move away from spatial analysis within sites to the analysis of wider areas and regions (Newman 2005: 210; Chapman 2006: 7; Lucas 2001: 127-8). Many archaeological GIS based studies have used the program's computing capabilities to assess functional environmental and topographical issues regarding visibility and access (e.g. Gaffney and Stancic 1991; Wheatley 1995b; Van Leusen 1999b)[15].

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[14] See section 5.9.1 for further discussion specific to the drove routes.
[15] The limitations of the bibliographic software do not allow Stancic to be correctly shown as Stančič.

GIS, Wheatley argues, should not be viewed as theoretically neutral as it is possible to introduce potential social perceptions of the landscape through, for example increasing the value of certain site types such as long barrows, thus allowing the use of post-functionalist frameworks (Wheatley 1993: 134-8). These post-functionalist frameworks move from the functionalist idea that practices of past peoples can be explained by functional relationships towards the use of emotional and social (rather than purely functional) responses to space and landscape (Johnson 1999: 191; Lucas 2001: 129) also seen in 'A Phenomenology of Landscape' (Tilley 1994) where a socialised view of spaces and landscapes from the perspective of a 'lived experience' are investigated.

Tilley uses monuments which fix visual relationships between places and provide an architecture through which the landscape might have been viewed with symbolic and ritual meaning. Roads form part of the architecture of the landscape but rather than being the 'viewed' they provide access to view. The lead industry, discussed in chapter 6, is a case in point. Lead miners, using the lead routes would have viewed the landscape over which they commuted and would have seen industrial changes developing and represented in their landscape experience. Industrial architecture is driven by different imperatives to the monumental architecture looked at by Tilley but can still represent similar aspects of power, materiality and evoke similar responses, for example, awe, fear and excitement.

Whilst industrial architecture and routeways can be imbued with symbolic significance it is not essential to their creation and does not have to play a pivotal role in their existence, this move away from the use of phenomenology in the creation of symbolism as presented by Barrett and Ko 2009 allows phenomenology to be considered and utilised whilst addressing some of its limitations, as discussed in Fleming 2006; Barrett and Ko 2009.

The theory that *"… the architectures and technologies of life change over time, and with them the possibilities of being in that particular world must also change."* (Barrett and Ko 2009: 290) will be shown to be the case with the lead routes in chapter 6 where the lead routes provided views of changing industries and technologies, changing the world experience of the miners who used the routes. Rather than concentrating on the ritual and the symbolic it is these elements of material existence experienced by people as part of their routine lives that the phenomenological approach to landscapes and roadscapes can help to reveal (*ibid*: 290). This concept of the interaction of people, history and places is explored by Pred 1984, who argues that in addition the idea that people do not choose their contexts but are subject to "*…already existing, directly encountered social and spatial structures."* (Pred 1984: 251). This material engagement, from which humanity becomes a product (Bruck 2005), highlights the multi-faceted role of roads and routeways in a landscape context. People interact both with the route whilst the route also allows the interaction with other entities for example, people, buildings, landscape and it is this which make the use of taskscapes[16], phenomenology and GIS a suitable and powerful combination for the aims of this thesis.

2.4 The Theoretical Framework: Facets of Identity as Power Dynamics in a Cultural Landscape

The idea of linking roads and identity may not at first appear to be an obvious enterprise and yet the modern phrase 'the rat race' links both the identity of the workers, with implications of employment type, and the routine traversing of the modern urban landscape. Through the exploration of identity as experienced from the use of roads and routeways this thesis will draw together the idea of the taskscape, employment, identity and gender. In combination with the landscape perspectives as discussed above these methodologies will allow the identification of not only the

[16] See section 2.4.4.

concrete physical concepts behind the decisions made by the users of the roads and routeways but also the social impact that these decisions had.

The concept of the "powered cultural landscape" is one that is key to this thesis. It has been seen that a cultural landscape is one which has been permanently changed by human activity and that, for this thesis, the alteration of the landscape is the creation of and maintenance of roads and routeways. To think of a 'powered' cultural landscape is to examine the power relations expressed through this cultural changing of the landscape. These power dynamics can be for example race, gender, class or ethnicity (Spencer-Wood and Baugher 2010; Spencer-Wood 2010). In this thesis gender, age and occupation are examined as facets of identity and as power dynamics by the ways in which they affect and are effected by the roads and routeways in County Durham. For example, as will be seen in chapter 4, with the ideology of appropriation the Romans used their identity as a conquering force as a power dynamic in turn using both the appropriation of routes and the creation of new roads to demonstrate their domination of the landscape and people.

Whilst roads may be mapped and traced as a functional part of a landscape, the purpose of this thesis is equally to explore the social, economic and human imperatives, which gave rise to the roads and certain choices in their locations, and more generally, the lives influenced by routinely travelling these routeways. Consequently, many of the issues which have been central to the development of social archaeology, and social archaeological theory, over the last 30-40 years are directly relevant to the thesis and have, indeed, been important to the author in conducting the analysis and formulating interpretations.

The most pertinent of these is the development of theories of identity in archaeology. Regional identities, gender identity and the construction of children's identities are all pertinent to the routine use and occupation of the routeways in this study and may draw on a wider archaeological, sociological and historical literature. Further, however, identities created within distinct *employment* should be considered, but these are less extensively explored in the wider archaeological literature.

People, countries, nations and even inanimate objects all have their own individual traits. The characteristics that a certain entity has, or displays, give it ‘identity’. The archaeologies of identity strive to build up a picture of both the unique identity of a past person[17] and/or the identities of communities and societies. The character of a person is comprised of many different socially constructed and negotiated aspects, such as status, religion, disability, gender, age and ethnicity. The identities of the communities are formed from these individuals and their interactions.

The archaeologies of identity are ever more influential with regard to methodologies and the creation of hypotheses and yet it must not be forgotten that these ‘archaeologies of identity’ are themselves a long way from being uniform in approaches and ideals. Despite this it must be remembered that,

> *“Archaeologists do not enter into dialogue with the people they study, but obligations to those people remain.”* (Barrett 1987: 472)

In recent years it is the three features of, gender, age (specifically childhood) and ethnicity that have been at the forefront of archaeological investigations into identity. The North-East Regional Research Framework for example highlights the study of Anglo-Scottish identities as a key research theme for the Post Medieval period as well as drawing attention to other identity themes that are key research priorities such as those associated with religion, profession and class (Petts and Gerrard 2006: 182). In so doing the criticism that archaeologists focus primarily on the labourers rather than the wider context that surrounded them (Silliman 2006: 150) will be addressed.

[17] For example from burial remains.

2.4.1 Gender

The idea that certain routes were imbued with gendered power dynamics is a component of the theoretical underpinning of this thesis, which will use the definition of gender as discussed below and it will be, for example, mooted that the drove routes represented a route whereby the drovers both created the cultural landscape and conferred upon it gendered power.

The archaeologies of identity arose as a result of the development of 'structuralist' theory, which in broad terms suggests that archaeological artefacts are a manifestation of a wide-ranging human culture. For a structuralist, 'culture' is a vivid medium of cognitive meanings (Johnson 1999: 91-2). This belief led to a focus on individual agents and the study of the small scale: a specific culture meaning certain things to one group. A critical awareness followed; that archaeology could be, and is, political and exclusive. The 'common sense approach' to interpretations, which used assumptions that people would act the same way in the past as they do now, was strongly criticised, especially in relation to gender roles. 'Women's Archaeology' encompassing feminist archaeology, gender archaeology and historical revision was the reactive result (Gilchrist 1991: 495).

The identity of women within the north east during the Post Medieval period could be easily overlooked as the predominant professions of mining and droving were dominated by men with the sphere of the domestic being the more common realm of women. This is not to say that this role was unimportant or that the work of women did not overlap into, or affect other areas for example they feature in later accounts and photographs at lead mines as sack makers and ore washers and dressers (Raistrick and Roberts 1984: 94, 188; Fletcher 1995). Research into the lives of women in the north east includes work by McPherson who has concentrated on the ethnicity and identities within the Irish Woman's Migration post 1830 (Green and Pollard 2007b: 2-3).

Feminist archaeology is politically motivated and as with the feminist movement it aims to change the patriarchal elements of today's society. It works for changes within the archaeological system such as equal professional/academic recognition and employment opportunities. It also promotes historical revision, seeking to acknowledge women in archaeological histories and to balance the subject matter of textbooks (*ibid*: 496, 499). Gender archaeology on the other hand concentrates on the formation of gender, distinct from biologically defined sex, both masculine and feminine (Voss 2006: 107) and it is on this basis that women are studied in this thesis, following the work of scholars such as Gilchrist and Voss.

Gender archaeology in Europe is interested in *"…a greater concern for the individual, manifested through the study of gender identity, sexuality and the body…"* (Gilchrist 1999: 7). It has highlighted the lack of objectivity within the discipline as historical discrepancies and cultural differences in gender relations and stereotypes are often ignored (*ibid*: 4). As a result 'common sense' theories are often avoided as gender identities and their associated artefacts change over time. As a replacement for trying to read backwards from the archaeological remains to give meanings to what went before John Barrett suggests that *"… a better proposal is to explore the implications of particular material conditions for the structuring of specified social relations…"* and the individual's identities (Barrett 1987: 471).

2.4.2 Childhood

Developing the idea that the drove routes were 'gendered', the power dynamics between age, gender and profession will be contemplated for the lead routes in chapter 6 and will show that the cultural landscape and experience of the landscape was one bound predominantly by occupation.

In its practice, gender archaeology opened the way to other studies of the 'small scale', the individual and identities (Johnson 1999: 124). The concepts of what defines a 'child' are variable as the parameters can be chronological, social or physiological. Childhood is even more problematic as childhood in modern Western Europe implies play and schooled learning. Childhood, *per se*, elsewhere would under this occidental understanding, be non-existent as children are part of the adult work force as in the Middle East, India and Pakistan where dexterous children weave carpets and make clothes (Sofaer Derevenski 1994: 10-12). These ideas are pertinent to this thesis as the use of children in the workforce is also seen in the burgeoning industries of County Durham in the sixteenth and seventeenth centuries.

The finding of 'toys' in the archaeological record has been a decisive factor in identifying children in the archaeological record. This relies on the ability to identify these playthings and on the notion that the children enjoyed a childhood where toys and play time were available. Even identifying the toys is often difficult as exemplified by the 'Millie's Camp' excavation of a, then, recently-abandoned Native Indian camp site in the central Canadian Rockies, Alberta. On this excavation a willow stick strung with dynamite wire was initially thought to represent a piece of trapping equipment, when it was in fact eventually demonstrated to be a 'stick horse' toy (Bronnichsen 1973: 277, 279). With the increase in the investigation of age as a part of identity the detection of child specific objects should be an aim of archaeological investigation, not a natural assumption (Sofaer Derevenski 1994: 10).

Children formed part of the labour intensive processing work force at lead mines, working on the 'dressing floors' where the extracted minerals were broken up and sifted through water to separate the heavier galena which contains the lead (Forbes *et al.* 2003: 49-50). It is interesting to note that within the lead ore extraction industry the two marginal aspects of the work force, the women and the children, eventually came to be in competition for the same jobs which ultimately changed the professional identity of the women as by the late 1800s they had not only been excluded from the work but the social view become such that it was deemed improper (Raistrick and Jennings 1989; Raistrick and Roberts 1984: 94).

2.4.3 Ethnicity

The north east of England, which includes the study area for this thesis, provides an interesting example of strong regional identity based on locality, rather than ethnicity. As evidenced in the lead mining areas of the Pennines where an ethnically diverse population created a regional identity based on occupations within the industry.

The archaeology of ethnicity as a part of identity is perhaps the most politically charged. Ethnicity can be defined as a "*…self conscious identification with a particular social group, at least partly based on locality or origin…*" (Shennan 1989: 14). If ethnicity is a personal identification, rather than a classification driven by race or place, then archaeological evidence for this will be scarce, if not non-existent (*ibid*: 14).

Much has been written on the complexity of the identities of both the north east and the counties and areas within it, indeed the 'North East England History Research Centre' was created with the key purpose being to deal with the question:

> *"Can North-East England, which is widely perceived as possessing one of the most distinctive present day regional societies, be proved to have been a coherent and self conscious region in the historical record from the beginning of the middle ages to the present day, and if so, what were its origins and how did its regional identity change over time?"* (Green and Pollard 2007b: 2)

The result of this research can be found in the volumes published as part of the Regions and Regionalism in History series which includes 'North East England in the Later Middle Ages' (Liddy and Britnell 2005) and 'Regional Identities in North East

England, 1300-2000' (Green and Pollard 2007c). Additional work on this topic includes 'Northumbria: History and Identity 547-2000' (Colls 2007). It is interesting to note that nearly all the authors in these edited volumes are historians and geographers, and yet archaeological interpretation of material culture and archaeology could (and should) also be used to investigate the multifaceted cultural and ethnic identities that emerged in the north east during the Post Medieval period (Petts and Gerrard 2006: 182). Outside the specific study of the north east of England, Lawrence 2003, provides an archaeological perspective looking at the identities in Great Britain and the Colonies.

2.4.4 Occupations and the Phenomenology of the Taskscape

Social history of the relatively recent past demonstrates that identities of considerable strength may be built up amongst workers and their extended communities involved in particular industries (McIvor and Johnston 2007; Allsop and Calveley 2009). This is particularly true amongst mining communities and much work exists on the modern sociology of coal-mining communities and their demise. There are indications that strong community identity existed historically, for example, amongst the coal miners of the Forest of Dean (Fisher 1981), and amongst the lead-miners of the Pennines (Hunt 1970). Sustained historical occupation of the landscape may have contributed to this, as would shared exposure to and appreciation of physical danger, and understanding of routine physical tasks and skills. Shared understanding of the way in which routeways traversed different landscape conditions, and how these should best be exploited seasonally may also have figured in the reproduction of occupationally-based identities.

Archaeologists have tended to explore some of these factors through applications of the concept of taskscape, drawing inspiration from Tim Ingold's anthropological work (Ingold 1993; 2000; Ingold and Vergunst 2008); an older, similarly holistic approach could be found in adaptations of the space-time geography of Pred 1985 and others. Here, knowledgeable routine occupation of the landscape and how it should be traversed is central to the reproduction of community and identity.

The temporality of the landscape and the need to see landscapes as the backdrop to human activities and as ‘cognitive orderings of space’, as highlighted in Ingold’s work, allows roads and routeways to be viewed as intrinsic parts of the landscape and as fundamental components to the facilitation of landscape experience, allowing the individual to interact with this temporality and providing access to both the inanimate and the animate facets of the landscape. This approach is complementary to the ‘being in the world’ concept as espoused by Tilley and Thomas as again it is the human knowledge and engagement with the landscape which creates ‘places from spaces’. With both of these approaches it is the interaction with the landscape that is pivotal and as such roads can be seen as important to both the experiencing of and creation of place, for example the drove roads created a landscape with a moving backdrop of thousands of cattle whilst the pack routes created the possibility for the interaction of consumerism within the comfort of the home.

2.5 Architecture

This thesis argues that roads and routeways were also the arteries of the dissemination of cultural ideas and directly affected aspects of consumption. In order to make this argument, architecture has been chosen as a suitable example as it provided a means of creating class consciousness. With regards to landscape archaeology, for example, using the concept of the taskscape, buildings can be seen to form part of the inanimate backdrop through which life is experienced and performed (Ingold 2000). In this thesis this has been used to investigate the way in which roads and routeways influenced and were themselves influenced by architecture. Buildings can be seen as signals in the landscape of past social and economic developments in the surrounding area and increasing numbers of landscape studies look at the cause and effect relationship between the buildings and their wider setting (Bowden 1999: 156-7). As a general background to the examples and discussion in chapter 7, an overview of architectural changes is presented hereunder.

2.5.1 The Move to the Closed House in a European Context

Between 1530 and 1730 Europe was undergoing many changes, not just in its geographical boundaries, and as such historians define this period as 'Early Modern'. It was a period of transition, moving to towards modernity in areas such as politics, economics and personal mind-sets (Tarlow 2007: 1). Britain, as part of Europe, was going through these changes and they appear in the archaeological record with the emergence of 'closed houses', developing from the 'open house'. It has been mooted therefore that the way in which people viewed themselves, their lives and their place in society during the Early Modern period can be studied by looking at house types (Johnson 1993; Grenville 1997; Morriss 2000; Johnson 2007).

Pre-1500 Europe was predominately rural and Britain was no exception. Life for the masses was centred around the household, comprised of all those living in the one house whether related or not and sometimes included the economically important livestock (Braudel 2002). The buildings themselves would have been divided internally by simple woven partitions to separate cattle from people, evidence for which has been found in the 'cob' houses in the excavations at the deserted medieval village of High Worsall (Taylor 1998: 57). The rise of the individual is often seen as having its roots in a series of catastrophic events in this fourteenth century Europe, becoming evident throughout the following centuries. The most influential factor was the plague; it decreased the population and as a result money was scarce, land decreased in value, wages rose and so people changed their way of life (Spufford 2002). These changes are reflected in the buildings of the time.

Peasants were able to buy the devalued land, paid employment was more available and industries were growing. People were able to survive above the subsistence level and invest money into creating a house for more than one generation and so the 1500s saw a marked increase in the building of permanent structures (Garner 1989: 1). The most common house type of this early expansion was the ‘open house’. These buildings are characterised by a number of architectural features including a hall with opposing doors at the lower end, with an entrance to service rooms. The warmer, upper end had access to the rooms of the owners (Johnson 1999: 111). With the clear upper and lower divisions it is evident that a more complexly stratified society was developing within the house. Whereas once all people shared one area, there was now a split between employers and employees. With the collapse of the restrictive feudal system society’s traditional class formation was able to change as some people profited more from its demise than others (Spufford 2002).

Unbalanced wealth distribution coupled with the increase in the numbers of working women (employed due to labour shortage), and an increase in migration between towns and villages caused values to change. Communities were less closed and there was a move towards personal choice rather than the following of tradition (Braudel 2002). Within houses however there was still a low emphasis on privacy. Over time this changed. Houses were converted or new houses built with visually less impressive halls, ceilings and more segregated areas. This is seen in different areas at different times often reflecting the prosperity of the people and the region (Johnson 1993: 64).

It was during the seventeenth century that the traditional cruck constructed house was replaced by the more versatile box-frame ‘closed house’. The box-frame allowed the building of another storey with more individual rooms, often each with a specific use (Garner 1989: 24). As each room had its own use so each room could be for specific individuals within the household giving more space to each person and more scope for privacy and personal development. Even with the continuing rise of individualism the family and kinship ties were stronger than they are in today’s society with the word ‘family’ being used to define a large group of relatives as opposed to the parent-offspring group to which it is more commonly applied today (Munck 1990: 100,101).

The rise in the popularity of brick as a building material increased towards the end of the seventeenth century. The predominance of brick increased throughout Europe at about this time, London used brick for the rebuilding of the houses lost in the Great Fire of London, Amsterdam used brick for all new buildings and Paris too became a 'stone city' (Braudel 1967: 195). Those who were not well off enough to replace their wooden structure with a brick one often created a composite building, filling in the wooden frame with bricks (Garner 1989: 18). These changes are an indication of the home owners wish to distinguish themselves as people who could afford the latest innovations, setting themselves apart from the crowd in as many ways as possible (*ibid*: 5).

The eighteenth century brought with it new trends in building types and the desire for 'Palladianism', the strict observance of fixed proportions. It mirrored the society's increased interest in the arts, mathematics, science and in the classics (Johnson 1993; Morriss 2000). The desire for symmetry and order can be seen in many ways. Where the owners had money buildings were built from scratch on the sites of older buildings, an example of this is Eden house, which is now St Johns College, in Durham built in the 1730s (Pevsner 1953: 247). Its four storeys are of dressed stone and the windows are paired in a mathematical way. This house can be interpreted as being a justification of the family's status and a further separation from those less well off, the theory being that, the model house displaying the perfect balance of order and symmetry must be a reflection of the individual people within.

More commonly the Palladian or the later Georgian style of regularity and order was imposed on a residence that was formally less symmetrical by creating a brick facade. The most obvious indicator of this is the fact that front doors are not centrally placed and windows, whilst at first appearing equally spaced, are not. These things reveal the uneven nature of the original, older, building behind (Garner 1990: 41). Signs of the new importance of social niceties and the rise in the quality of lifestyle can be seen in additional features such as foot scrapers and coalholes. These guides can be seen in the houses throughout the country and Europe, some houses showing more changes than others; people made the changes that they could afford. This Georgianisation was one step further than the closing of an open house. It emphasised the physical, visible and intellectual separation of those within the house and completed the change from the house as a community to the house as a household of different people (Johnson 1993: 108,109).

Chapter 7 draws on these rationalisations, as seen in Johnson 1993; 1996, and examines the effects of roads and routeways on homes in the north east on vernacular and gentry architecture, looking at the closure of the buildings, the individuals who inhabited them and the role that the transport network had on their creation and change.

2.6 Summary

In order to support the scope of this thesis, a unique suite of theoretical and landscape approaches is used to redress the balance of the economic and functional against the social imperatives and responses to roads and routeways. Concentrated narrative is used to explore elements such as the maintenance of the roads and routes. The concept of cultural landscapes is applied to support both the functional and the emotive aspects of the landscape analysis generated by the GIS. Phenomenology and taskscapes are also used in conjunction with the GIS in order to scrutinise the powered dynamics brought to and created by the road and routewayscape.

"The true method of knowledge is experiment…"

(Blake 1982)

3 Methodology: Review and Analysis of Methods

The particular approach taken in this thesis, seeking to redress the balance of the social and the economic or functional in the location, form and use of roadways, uses resources, evidence and approaches from many disciplines and consequently necessitates the selection of a particular set of methods of analysis. This chapter reviews the methodologies of the different approaches and techniques applied in this thesis, from the broad scope of road studies in general, including relevant historiography; through to the methodologies appropriate to the individual techniques applied in the study: GIS in archaeology, GIS viewshed analysis, the use of aerial photographs and the Aerial5 software package, remote sensing, documentary sources, excavation, and applications used in post-excavation analysis (in this instance radiocarbon and luminescence dating).

3.1 Geographical Information Systems

At a general level GIS, can be seen as a powerful computer-based tool for the compilation, manipulation and transformation of geographical and non-spatial data (Wheatley and Gillings 2002: 9). Key features for the analysis of the roads and routeways in this study are the cost surface and viewshed illustrations and calculations produced in ArcView 3.3. This has since been supplanted by ArcGIS. The decision to continue using ArcView 3.3 was, however, twofold due to: the amount of data collected and collated into the GIS and the user familiarity with its cost and visibility calculations.

The use of GIS and its technical and computer based processing has become an increasingly large part of the archaeologist's work. From its origins in the 1960s GIS rapidly became integrated into this work, where it is routinely used to deal with large amounts of spatial data. For example, data from excavations, geophysical surveys, environmental studies and maps, can be used at many different technical levels and for widely varying purposes. Data can be analysed in ways that would previously have taken years of work, and with increasing computer power more calculations can be done more rapidly. The advantages of these advances are clear; larger areas can be studied and more analyses can be executed ever more swiftly. These benefits widen the opportunity to create new hypotheses and study increasing large swathes of landscape rather than the traditional discrete 'sites' (Gaffney and Stancic 1991: 29-30), enabling the study of networks in such diverse places as Wales and Syria (Rees 2004: 203; Ur 2003: 106).

GIS software allows the collection and co–ordination of spatial data with other factual information. A good example of this is the Durham County Council, 'Keys to the Past' project which combines and provides the user with both geographic and non-geographic information and will be used as a basis to integrate all future landscape character assessment work[18]. A nationwide partnership project which uses GIS to create an interactive internet based resource is the Multi-Agency Geographic Information for the Countryside or 'MAGIC'. This is a collection of information from partners, which include English Heritage, the Environment Agency and Natural England (MAGIC 2009).

Studying the landscape has been a significant factor in archaeology for decades, indeed the themes of systematic landscape analysis such as site catchment and distribution patterns pre-date GIS (Wheatley and Gillings 2002: 147). Despite its maturity as a study genre it is still important to understand why the landscape is

[18] A long term goal is for the whole of England's archaeology to be mapped and accessed through GIS (*Pers. Com.* Horne 2005).

thought to be important and how GIS is thought to help in its study. It is the landscape resources and their uneven distribution which affects its use, both past and present. For example, lead ore is only available in a few specific areas and so people move there to exploit that particular resource, creating associated infrastructures: practical, political and social. It is this interaction of the landscape influencing people and the people simultaneously shaping the landscape that is used to justify the archaeologist's fascination with landscape studies (Van Leusen 1999a: 215). In the case of roads and travel networks it is the relationship between the passage of people and animals through, around and over the landscape and their use of different aspects of the landscape which is of significance.

3.1.1 GIS and Cost Surface Analysis

Two functions of GIS which will be used in this thesis are cost surface analysis and viewshed analysis. Cost surface analysis can be used to give the cumulative cost, using criteria such as slope and land use, of travelling over that landscape. Viewshed analysis allows the visibility between two or more points in the landscape to be determined and is used in this thesis to investigate the visibility of the market towns as the drove routes approached them to explore the possibility that the drovers forged the routes using channels of visibility and that mutual visibility from the towns allowed for the preparation for the arrival of the drove.

Cost surface analysis allows the question of distance to take on a new dimension. Two dimensional distance measurements do not take into account the terrain that has to be crossed. So whilst two locations may be the same distance from a source point in a two dimensional world they may not have the same 'cost' associated with the journey to them if one is frequently elevated and the other is across solely even terrain (Wheatley and Gillings 2002:151).

Cost surface analysis is defined succinctly by Van Leusen as:

> *"…the ability to assign a cost to each cell in a raster map*[19]*, and to accumulate these costs by travelling over this map…"*
> (Van Leusen 1999a: 216)

A three dimensional landscape model is divided into equal squares, or cells, each square is then allocated a cost for crossing it, producing a cost grid. This is usually defined by slope, where by a steep slope would cost more to cover than even terrain. The cost of a journey can then be calculated by totalling the costs of each square that has been covered on the defined journey. A least cost route can also be plotted by the GIS, which calculates the route over the grid which costs the least. These routes are often much longer as they are determined predominantly by the cost of the slope rather than any additional distance or time required to make the journey.

3.1.2 Isotropic and Anisotropic Journeys

Cost surfaces, which are a form of raster map, can be either isotropic, displaying equal properties in all directions, or anisotropic, displaying unequal properties or acting in different ways in different directions (OED 2010). Isotropic algorithms take into account only the cost of the movement assuming that the cost of the travel is the same in all directions i.e. the same cost from B to A as A to B. Anisotropic algorithms are more complex as they take into account the direction of movement to be an influencing factor (Wheatley and Gillings 2002: 151-2). Lead routes can be considered to be isotropic as the packhorses are loaded in each direction, one way with the smelted lead and on the return journey with wood and provisions; they also combine both climbs and descents in each direction. Drove routes are highly anisotropic because, there is evidence to suggest that on their return they did not use the drove routes but took more direct routes, rather than retracing their southerly

[19] A raster map records spatial data in a regular grid.

journey (Bonser 1970; Brown 1996). Even if they were used by the drovers on their return route then the drovers were travelling without cattle, making the travelling conditions anisotropic.

Slope is a case where an anisotropic algorithm displays its usefulness as there is a different cost associated with going uphill from going downhill or along a flat route. The relationship is complex since it is not necessarily easier to walk down hill and a moderate upward climb can be preferable to a steep desent where a lot of effort has to be applied to stop freefall desent. Investigations into the effects of slope on speed and energy expenditure have been performed for example, Ericson and Goldstein 1980; Llobera 1999; Wheatley and Gillings 2002. Figure 2 illustrates the work of Llobera which demonstrates that the easiest path is on a slight downward incline (Llobera 1999: 65-7).

Situations that are more difficult to model and appear to be less well studied include; the carrying of loads, the effect of socially or politically difficult environs and differences in terrain types. The consideration of loads makes the algorithms even more complex. To make the situation realistic loads would have to be defined in weight, awkwardness and discomfort (e.g., it is easier to carry goods in a backpack than in your arms) and the time factored by the distance the load is carried. The type of terrain can also be a very important factor, even if it is not a slope, because it is much more difficult to walk through thick woodland than it is to walk across a meadow. Difficult types of terrain such as marshland or ice are often modelled as isotropic because they are equally difficult on the way there and the way back. A fast flowing river would be modelled as anisotropic because it is much more difficult going up stream than downstream (Wheatley and Gillings 2002: 155).

Physical and practical aspects of the landscape can be incorporated in a qualitative model. There are also social, political and cultural elements to consider. Areas of the landscape are, even today, imbued with social meaning: after all, who would not walk a little further to avoid walking through a cemetery at night? Regions of political unrest may have been impossible to pass through, people of a certain social status may have been excluded from some routes or it may have been required to visit a shrine when passing close by. These aspects are not included in current models but are relevant to the discussion of past road systems. It is perhaps only when routeways have been excavated or located on aerial photographs and then found not to match Least Cost routes that it may be possible to look at these other influencing factors (Wheatley and Gillings 2002: 155). Some influencing aspects can be mapped (in the historical period at least) and these include documented land ownership and areas which were governed by particular laws which affected and restricted their use and access to them, such as deer parks and common land.

3.1.3 GIS Viewshed Analysis

Viewshed analysis is one of the most commonly used GIS tools. This function allows the questions ‘what can I see from here?’ and ‘what can be seen from there?’ to be studied at different levels. Visibility has played an important role in the archaeological interpretation of sites in a landscape setting such as forts, stone circles and barrows for many years (Van Leusen 1999a: 218). The viewshed of a road is more complex because, although the road is fixed in the landscape, the viewer is not and the passage along a route changes with every step. This changing ‘viewscape’ is difficult to reproduce in a GIS and is one of the many aspects of visibility that is being discussed as part of the wider issues and interests around ‘viewing space’ (Lake 2007: 1).

A viewshed is obtained using a terrain model; this can be in the form of a Triangular Irregular Network (TIN) model which can be created in the GIS using contour or spot height data, and a point location to be the observation or source point. Topographical data already in grid form are available from airborne laser scanning data sources such as LiDAR, with which highly detailed digital elevation models (DEMs) can be created and these are becoming increasingly popular as a source of terrain data (Devereux *et al.* 2008: 470).

In this study ArcView 3.3 was used to create viewsheds at points along drove routes on the approaches to market towns and also for the reciprocal view from the town to the drove route. When using ArcView 3.3 to create a viewshed the TIN and the source point are selected following which the output grid size and cell size are defined. A grid is an object or layer which contains spatial data in a raster format, i.e. in squares of information, the size of which is set by the user. The grid exists in the same co-ordinate system as the map data, with the rows and columns running parallel to the axes.

Figure 3 illustrates this procedure graphically. A line from the source point is drawn to a target cell and evaluated in relation to all the heights of the intervening cells. Even if intermediate points are lower than the destination cell, they can still block the view depending on their intersection with the interpolated line. This calculation is done for every cell so the larger the grid and the smaller the cells the longer the time required to produce of the viewshed. The result in ArcView 3.3 is a viewshed grid with binary values in each cell: 0 for not visible and 1 for visible (Wheatley and Gillings 2002: 204-5).

There is the opportunity to manipulate viewsheds for a point by varying the height of the observer. This is often set to a default, either of 1m above the ground or 1.7m the eye level of an average man (*ibid*: 205). Looking at the viewsheds with the point set to the height of a child or a woman can highlight key areas that can always be seen rather than those that could only be viewed by the tallest people. Whilst the eye level of a man and a woman may not be significantly different the eye level of a man on horse back could potentially provide a wider viewshed. Scottish drovers are, however, most frequently referred to as being on foot and so the eye level of an average man on foot has been used in this thesis.

For sites such as stone circles there is no specific point from which to execute the viewshed analysis and so it can be illuminating to shift the observer point around the site. A single viewshed can also be studied statistically to see which directions, elevations, aspects or slopes are the most visible. This statistical appraisal can then be used to compare different site types or the same type of site in a different location.

An early example of viewshed work is the study by Gaffney and Stančič on a possible watch tower network on Hvar, an island off the Dalmatian coast. Here single viewsheds were used to show that a system of inter-visible watch towers could have formed a comprehensive protection system for the town of Pharos (Gaffney and Stancic 1991: 77-8). More recently Llobera studied a sub-set of Bronze Age round barrows in the Yorkshire Wolds, extending and adding to previous research by looking not only at inter-visibility but also ‘co-visibility’, taking into account possible problems which the chronology of the monuments, and how these uncertainties affect the co-visibility (Llobera 2007: 51). The concept of a viewshed is not constrained to large areas of landscapes, Giles, in her work on visuality and space, looks at the power of vision and placement of religious art in Medieval churches. She suggests a non-linear progression in the concepts of vision throughout history, with people of different times experiencing the visuality of their material culture and spaces in different and perhaps conflicting ways (Giles 2007: 116).

3.1.4 Cumulative Viewsheds

Cumulative viewsheds are different to multiple viewsheds as they are created by summing the individual viewsheds thus giving a raster surface displaying, usually in colour gradations, the number of source locations visible from that cell (Wheatley 1995a: 173). Wheatley uses the cumulative viewsheds of long mounds on the Salisbury Plain to examine statistically their inter-visibility. The analysis was based on the number of sites visible from each site, the values of the cumulative viewshed, and the application of statistical tests. This showed that the mounds were not randomly placed but located in areas from which other long mounds could be seen and were visibly notable. Although the lines of sight were shown to be statistically significant visibility may not have been the sole reason for the location of the barrows (*ibid* 182-3; Wheatley and Gillings 2002: 215). The issues of mutual visibility are examined for the drove routes approaching the market towns of Wolsingham and Stanhope in County Durham in chapter 5.

3.1.5 Edge Effects

Edge effects are an artefact of the GIS procedure. They appear because the area to be studied can never be infinite so there is always 'an edge' to it. GIS packages work in square grids whilst viewsheds are often studied in increasing radii, hence it is essential to ensure that the final radius of interest is comprehensively included in the viewshed. This is especially important where cumulative and multiple viewsheds are to be used and can lead to large areas having to be covered to avoid 'edge' effect within the study area. The concept behind this problem is very simple but is often overlooked (Van Leusen 1999b: 219).

In this study additional topographical data were used to make sure that the areas examined were within the central part of the TIN (Triangular Irregular Network) model to avoid edge effects caused by the TIN creation. The viewsheds were also created to ensure that the final radius of interest was included.

3.2 Use of Viewshed and Cost Surfaces

Viewsheds along drovers' routes in County Durham were used in this study to investigate the hypothesis that one of the placement criteria for these routes heading towards the market towns was based on the visibility of the town on this approach. Points away from the routes are examined to establish the significance of these findings. This is combined with fieldwork, looking at the current views to assess the

DTM, and to refine it. In addition mutual visibility, of the routes to and from the key market towns is investigated.

Least cost distance analysis is used to establish the primary concerns for the routing of a sample of the best known lead ways in the North Pennines in Durham. Aspects affecting the cost grid such as slope and land type will also be investigated. The shortest route distance forms the centre of the analysis of the Roman network.

In addition to these specialised investigations each route type will be analysed and compared, using GIS, in terms of: land types covered, changes in elevation and slope.

As part of the GIS procedure the size of the grids used for the viewsheds and Least Cost analysis have been defined in every case as 50m x 50m. This resolution is supported by the error inherent in the source data and the resultant models.

3.2.1 Digital Maps and Data Sources Used in the GIS

The Ordnance Survey's Landline series of maps have been used for this thesis. These, as with the Panorama contours used for the terrain model were accessed through Digimap[20]. Landline[21] is a detailed dataset, eminently suitable for use with aerial photography, optimised at a scale of 1:2,500 for rural areas, 1:1,250 for urban areas and 1:10,000 for mountain and moorland areas. Modern land use maps were obtained from Durham County Council in digital form compatible with ArcView 3.3 and contains data collected in 2004.

The viewsheds are created from digital terrain models (DTM). These DTMs are, in turn, created from contour data and/or spot height data and it is the quality of this initial data that can have the greatest effect on the resultant viewshed. In Britain the

[20] Available for participating Universities and Higher education establishments.
[21] Landline is now obsolete and has been replaced by OS MasterMap, which, although available at the same scales is structured around polygons for items within the map e.g. buildings and fields rather than just containing lines.

Ordnance Survey's digital Panorama contour data[22] available for subscribing Universities through the online service "Digimap" is at a scale of 1: 50,000 and *'…typically better than 3 meters root mean square error…'*[23] (Digimap 2009) and it the Panorama data which has been used in this thesis.

3.2.2 Plotting the Routes

The routes were plotted using a wide variety of materials, resources and techniques. Basic data for the Roman roads was extracted from both the modern OS and historic OS maps in paper and digital form. Points pertinent to the Roman network were then created in the GIS using data from the HER[24]. These included Roman finds, milestones, settlements and excavations. Locational data from the Lizards farm excavation and site visits to Weather Hill Wood were also added to the database[25]. Aerial photographs of a feature classified as a Roman road were analysed but were not included in the mapping[26]. The data were then combined and adjustments to the OS course of the routes made where the archaeological evidence was clear in showing that the refinements were justified.

The lead routes were mapped using modern and historic OS maps. The HER data for buildings, sites and evidence of the lead industry is extensive and again was collated and used to create point locations in the GIS. Aerial photograph evidence was consulted, rectified and studied to assess whether or not it could be included[27].

The drove routes were mapped using information on modern and historic OS maps, unlike the lead routes and the Roman roads which can appear on the maps marked as definite routes such as Dere Street or survive as footpaths and rights of way as in the

[22] Produced from 2003 edition of the product only available through Digimap, not commercially, and no longer updated. It has been replaced by Land-Form PROFILE.
[23] This is absolute error and so the relative accuracy over smaller areas is better.
[24] The HER points plotted for all the routes can be seen in table form in appendix 2.
[25] See section 3.6.3.
[26] See section 3.3.4.
[27] See section 3.3.4.

case of some of the lead routes, the drove routes were also frequent in their appearance on the maps, as routes. HER data were therefore pivotal, and known rest stops for cattle, inns, the market towns and locations through which the drove routes are recorded as travelling were plotted. To supplement the limited HER data for inns the registers of licensed premises for the districts of County Durham were resourced from the OS and establishments pertaining to the droving industry, such as the 'Drovers', were mapped[28].

Whilst every effort was made to create accurate digitised plots of the routes the limitations of the data, as illustrated by the offsetting of the Roman road on the OS maps, are acknowledged. The drove routes also differ in nature from the other routes as they were corridors of movement rather than well defined tracks. These features were some of the considerations taken into account when choosing the resolution of the grids used in the GIS.

3.2.3 Data Processing for the Least Cost Paths and Viewsheds

Ordnance Survey Land Line Plus and Panorama Contours were downloaded from the Edina, Digimap Web resource. A TIN model was created from the contour data using ArcView 3.3. Following the removal of extraneous lines that had no elevation values, a grid of elevation values was formed and then a slope grid was created. For each investigation start and destination points were created. Cost direction and cost distance grids were calculated for each source point. From these, the least cost paths were determined. The individual methodologies for the creation of these elements are discussed in the following paragraphs (a-e).

a) TIN

A triangular irregular network, TIN, is an object used to represent a surface. As a surface a TIN can be represented in many different ways and it also implies a specific

[28] Under the regulations by which the data was provided by the OS these points cannot now be included in the thesis because the licence for use was time dependent.

structure of surface data. A TIN partitions a surface into a set of contiguous, non-overlapping, triangles. A height value is recorded for each triangle node. Heights between nodes can be interpolated, thus allowing for the definition of a continuous surface. This makes it possible to represent a complex and irregular surface with a relatively smaller data set.

The ‘create new TIN’ dialogue box in the software which allows the selection of the height source, in this instance the Panorama contour files, and the form of input, which was set to ‘mass points’.

b) Slope

The slope function in ArcView 3.3 calculates slope for each cell in the surface represented by a grid. It identifies the slope, or maximum rate of change, from each cell to its neighbours. The output slope is then generated in degrees.

The theme on which the software derives slope is selected from the Surface menu ‘derive slope’ is chosen. The option of choosing a 'z' factor, an elevation value, is provided.

The output slope grid theme represents the degree of slope, for example a 5 degree slope for each cell location, is named automatically “slope of” followed by the name of the input theme.

c) Least Cost Calculations

These calculations require the creation of a numeric value grid representing the cost of traversing each grid square feature. The cost values are used in the analyst functions to find the best or least cost route across the grid. This cost can be defined in terms of time, distance, money or slope and the function will calculate the least cost paths from the set of cells providing that data are in the grid. The cost in the grid was defined as slope in degrees from 0 to 90. A start, an end point and the slope grid over which the path was to be calculated were defined and the least cost routes generated.

d) Map Calculations

The map calculation function allows the user to create mathematical statements with the grid themes which are in the active view and generates an output grid theme using the calculation. This function was used: i) to establish the percentages of each land type crossed by the routes and the least coast paths ii) to give extra weighting to the grids for the investigation of the effect of the importance of land type on the routes iii) to create the cumulative viewsheds.

e) Viewsheds

The elevation surface theme on which the viewshed was determined was chosen and the observation point defined. The calculate viewshed option was then selected. The height of the observation point was also defined, 1.7m, in this study, the height of an 'average' man. The result for each observation point was a grid theme with visibility attributes assigned to every cell, with each cell being either visible or invisible.

3.2.4 Extracting the Data for the Graphical Plots

The GIS was used to automatically extract elevation data from the terrain model at 50m intervals along the routes of the Roman road, drove route and lead route networks. The least cost routes for these data, generated in the GIS, was exported as a text file and used in Excel to produce the slope data and to generate graphical plots. These data points are displayed graphically in three ways:

- Elevation against distance for the length of the route to provide a side on 'view' of the topography of the road. Each of these has the horizontal distance (i.e. the distance if the route was flat) and the traversed distance (the actual distance of the route) marked. The difference in most cases although not large and can be seen in Table 1.

- Slope in degrees against point number (one point every 50m) to illustrate the varying amount of slope over the route.

- The change in elevation between points is shown as a histogram. For a modern road, which would aim to minimise extreme slopes, the bins[29] for the least change in elevation (near to 0) would be expected to have the highest frequency. This pattern would also be expected for the Roman network, and also for the network of drove routes due to the operational difficulties of moving and controlling a large number of cattle across the countryside. For the lead routes the packhorses are able to traverse a much wider variety of terrain and hence these histograms are expected to differ.

The Roman routes were used in each direction, therefore each graph can also be considered in reverse for the reverse of the route, i.e. a slope down one way will be a slope up in the other direction. The drove routes were predominantly used in one direction and the graphs have been plotted for this direction, that is, from the north to the south of the county. The lead routes were used in each direction, and hence analysed as for the Roman roads.

To combine the elements of 'human presence' and the concept of 'being-in-the-world' with GIS analysis the graphs are plotted to visually represent the routes as they would have been experienced by those using them. This means that the plus and minus values of all the route types are presented in the plots. This has relevance to the isotropic Roman roads and lead routes as, the sign of gradient for the slope is dependant on the direction of travel and could be presented using the absolute values.

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[29] A bin is *"a series of ranges of numerical value into which data are sorted in statistical analysis"* (OED 2010).

Where displaying the absolute values highlights a specific issue additional plots are provided.

To present the data from the routes in a way that that allowed comparisons between the routes, the axes of the elevation vs distance graphs and the slope plots were adjusted to include all the routes or least cost routes:

i) Elevation vs distance graphs x, 45,000m; y, 700m. Least cost routes, x, 90,000m; y, 700m.

ii) Slope graphs x, 900; y, -25 to +35. Least cost routes, x, 18,000; y, -15 to +15.

The scales were fixed because very different visual representations are created when shorter routes (e.g. the lead routes) are plotted with a lower x axis range and the reduced number of points over a shorter distance gives the appearance of a much smoother terrain. However, the extra length of the least cost routes made it unfeasible to plot all the routes to the same scales.

3.3 Aerial Photographs

The aerial photographs were obtained from the collection held by Archaeological Services Durham University (ASDU). The photographs were rectified and classified and the digital plots of the routes from the photographs were extracted, georeferenced for use in the GIS. The method used in this thesis for aerial photograph rectification is discussed in this section. The classifications are in appendix 1.

Aerial photographs are an important archaeological resource for finding, mapping and monitoring areas of archaeological interest. The technique has advanced considerably since the first aerial photographs were taken by hot air balloon and by kite and they are now often taken in a digital format by a satellite rather than on celluloid from a plane.

Accurate plans of sites and placement of a site within the larger context of the surrounding countryside is simplest with a vertically taken photograph. Oblique photographs, taken at an angle, reveal contours not visible in vertical pictures and it is this method of aerial photography that has been used for this study. The nature of the oblique photographs means that the spatial information on them is distorted by perspective[30]. To use them for quantitive analysis they need to be rectified, to provide the correct spatial resolution.

Vertical photography is increasingly provided by satellite imagery[31]. (Scott *et al.* 1990, Casana and Cothren 2008; Beck *et al.* 2007). Satellite data can be optical imagery, i.e. conventional photographs or digital images, such as those from Ikonos, QuickBird and ORBVEIW (Holland and Marshall 2004: 1). Not all satellite data is visual imagery, for example Landsat 7 provides multi-spectral data, with a resolution of 15-80m, from a range of wavelengths that can be viewed in a variety of combinations, extending from the UV to the infra red (Pavlidis *et al.* 2002: 394; Parcak 2009: 58).

A combination of optical imagery and multi-spectral data was used to find the Ubar, the 'lost city' or 'Atlantis of the Sands' in 'The Empty Quarter of Arabia', the key to its discovery was the identification of converging routeways (El-Baz 1997: 60). The discovery of roads and routeways in the UK is, however, more easily done using oblique photographs, due to frequent cloud and ground cover.

The sites that are commonly photographed are classified as crop mark sites, shadow sites and soil marks. Crop mark sites come into being when a hidden feature

[30] There is also some distortion in vertical aerial photographs due to the camera lenses.
[31] All satellite images are vertical.

promotes or stunts the growth of the vegetation above it. Shadow sites are visible as an integral part of the relief of the landscape[32]. They are referred to as shadow sites because either early or late in the day the topographical features are made more distinct by the formation of shadows. Soil marks are seen when agricultural land has been ploughed, revealing evidence of human occupation through variations in the colour, type and texture of the soil. Of these different types, crop marks are the most common and most photographed (Wilson 1982: 6).

3.3.1 Aerial5

Aerial photographs were rectified using the software programme Aerial5. Although more advance software has been developed (AirPhoto, developed by Irwin Schollar also provides rectification facilities BASP 2009) Aerial 5 has sufficient functionality for this work.

It was developed by John Haigh at the University of Bradford, specifically for the rectification of archaeological aerial photographs. Digital aerial photograph images saved as TIF (Tagged Image Format) files that retain the maximum resolution of a scanned image are used (Haigh 1999: 5). It can also use maps saved as TIF files and this can be achieved in two ways, either by scanning 'paper' maps or through the direct use of digital maps.

3.3.2 The Aerial Photograph Rectification Methodology

When using Aerial5 the map is registered to its correct location within the National Grid by selecting grid corners on the map. Then, as with the manual techniques, a minimum of four reference points on both the aerial photograph and the map are selected. The software then provides an assessment of the uncertainty on the selected

[32] Aerial photography of shadow sites is usually to clarify and consolidate information on a known site rather than for prospection.

reference points. The subject photograph is rectified to a selected scale and this image is then stored as a ‘rectified TIF image’.

To superimpose the archaeological features in the rectified images onto Ordnance Survey maps, the software CorelDRAW4 was used. This program permits the use of separate layers of information, allowing the map, the rectified aerial photograph (at the same scale), and an overlay of the archaeological features (traced using the ‘Bezier tool’ function) to be assigned to different layers and viewed in different combinations. The resultant computer plots are versatile but the software imposes certain limitations on stylistic interpretation and presentation. The styles used for the mapping presentation are therefore different to the ‘classic’ hand drawn examples produced using the Möbius Network technique or the Paper Strip method which enable more traditional conventions for aerial photograph transcriptions to be followed.

GIS software packages allow the creation of numerous different layers of information about and of the same area e.g. aerial photographs, geophysics results and topographical survey to be variously combined and displayed together, thus giving the aerial photograph a 3-dimensional form (Powsland *et al.* : 1). Recent work by Finch and Gibbs uses Aerial5 to rectify estate maps, sketches and enclosure maps although this does reveal some limitations in this version of the software as to how distorted a source can be to be rectified with a reasonable amount of associated error (*pers. com.* Finch and Gibbs 2005).

These techniques and processes, if executed with care, provide accurate, georeferenced aerial photograph plots. Systems that automatically calculate the geographical co-ordinates of high quality digital photographs and transfer them straight to GIS have been investigated but require new photographic data from flights rather than permitting the use of existing catalogued photographs (Leckebusch 2005: 235, 238).

3.3.3 The Classification of Crop marks

Once a photograph has been rectified, or transcribed, the archaeologically relevant features such as crop marks, earthworks etc. can be identified. Although many classification systems are in use, they fall into two key types, which can be loosely termed as reductionist and interpretive. The Royal Commission on the Historical Monuments of England's (RCHME) reductionist methodology was followed because it is simple, structured and avoids subjective evaluation and interpretations. The tables of classification for the crop marks from the aerial photographs can be found in appendix 1.

3.3.4 Using the Aerial Photographs

The aerial photographs were analysed to assess their pertinence to the study. The Low Allers aerial photograph was rectified and the GIS used to try to assess whether or not they formed part of the lead routes connecting the Bowman's Vein and Races Head. In addition the effect of grid size on the least cost paths was investigated. The Greencroft aerial photograph was rectified and the HER, and local information used to consider whether its labelling as a Roman road is appropriate.

<u>The Low Allers Aerial Photograph (figure 4)</u>[33]

Low Allers is a hamlet consisting of three farms to the south west of Killhope. The farm where the aerial photographs show track ways is present on the Ordnance Survey map of 1896 (see figure 5). This early OS map has a foot path marked (the modern Landline data does not), in the same orientation as several of the photographed tracks. The map seems to show a convergence of tracks, possibly because of the proximity of a bridge to cross Killhope Burn[34].

[33] Low Allers. Held by ASUD Negative 13/4

[34] It is well documented that many of the mines in the area sent their ore to Rookhope smelting mill beyond this river (Raistrick and Jennings 1965; Hunt 1970; Raistrick and Roberts 1984; Forbes *et al.* 2003).

The route from mine to mill was studied in two separate stages, with the footpath visible on the path and on the map as the central source point. The lead mine was defined as a point at the Bowman's Vein workings and the final destination was Races Head - an intersection point for several carrier ways en route to the Rookhope smelting mill.

<u>Grid Resolution</u>
For testing purposes, investigations into the significance of the cell size defined when creating the slope grid were explored. Four different slope grids were created: 50m x 50m, 20m x 20m, 10m x 10m and 5m x 5m cells. The visual differences in the resultant cost direction plots between the 5m and the 20m plots were great, whilst there was little visual difference between the 10m, 20m and 50m examples. The resultant least cost routes were different as were the associated costs (see table 2 for examples). The cost of taking the route defined by the coarser slope grid was higher than that of the route using the finer resolution.

It is clear from this test investigation that the selection of a suitable cell size when creating the grids that are going to be used in the cost path definition is pivotal. The idea of accuracy, however, has to be used with care. The TIN model was created using the OS Panorama data, which is accurate to ± 2.5 ~ 3m (Edina 2002) and so no greater resolution of grid squares could be justified. Other factors to consider include time and purpose, the results from the finer grid took considerably longer to generate and so if many areas were to be studied at a landscape level, or county wide level, a coarser resolution is more appropriate. The remaining analysis of the route identified in the aerial photograph was carried out using the 5m x 5m cells whilst, as previously discussed, a resolution of 50m x 50m was utilised for the main study sites.

<u>Least Cost Routes</u>
The least cost paths were calculated both to and from Low Allers, with source direction and distance grids changed accordingly. The routes were the same on both the outward and return journeys, with only a slight change in the cost, and could,

therefore, within the limits of this study, be considered as isotropic. In addition, as the horses would have been laden both ways, there was no need to reduce the load cost on the return journeys.

Low Allers to the Lead Mine

The route closely follows Killhope Burn, a result of using slope as the forming factor. Its route is not unlike some of the footpaths marked on the 1896 OS but does cross back and forth across the river which in real life would add a large amount of cost. A refinement needed here is the raising of the cost value of the river forcing the cost path to take a more realistic approach. This may also make the route match more closely with the aerial photograph paths which converge at a bridge.

Low Allers to Race Head

The route is difficult to trace with the missing map data but follows the modern route of the A689 along a 'valley' before heading up a steep incline next to what was a mine managers house and then on to Race Head, not quite following the old pack horse route. This trail was well used as, in addition to the pack horses, it was the route taken by the miners commuting to work (Durham County Council 1996).

Mine to Race Head 'Direct'

The route of this least cost path is intriguing and illuminating. There is often conjecture about why the pack horse trails forge their way across the hill tops rather than taking 'easier' routes. The least cost route from the mine to Race Head is up the valley side and then right around the top of the hills, in basic practical terms this differs from the Low Allers route only in that it climbs the hill first then takes the level ground rather than walking the level ground then followed by climbing the hill. There is another possible reason for the routes taking the high ground: the valleys were often used, as the only fertile and sheltered land for agricultural purposes (explored in chapter 6).

Conclusion

None of the rectified aerial photograph tracks were incorporated into the least cost routes. This could mean that they were never used for the lead industry, that they served a different mine further south or that the lead mining routes were governed by factors other than those used in the creation of the least cost paths.

The Greencroft Aerial Photograph (figure 6)[35]

The parish of Greencroft is situated in north west County Durham, within the Derwentside District. The parish, to the north of Lanchester, is roughly quadratic, bounded to the north east by Tower Road, to the south east by Howdean Bank, to the south west by Stockerley Burn and to the north west by Stony Heap Lane. Before becoming a civic parish Greencroft was a township within the parish of Lanchester All Saints.

The 'Roman' Road Identified in the Aerial Photograph

The course of a Roman Road called Watling Street is clearly marked on the 1921 OS map. The current Landline data marks it as being Dere Street. An additional section of what has been identified as a 'Roman' road can be seen in the aerial photographs of Esp Green (Reed and Austin 1976). Enclosure and tithe and apportionment maps and records were consulted but no reference to the road was found. A spot find of a copper alloy 'dragonesque' Romano British brooch has been dated stylistically to the first half of the second century AD. It is thought to be a northern artefact and part of the 'East Brigantian' metal working tradition'. It was found south west of Esp Green but has been linked with neither to the well nor the road (Pickin 1993). A spot find of a decorative mount in the form of a lead alloy deer head was found near the Lady Well. It has not however been successfully dated but the "…*vigorous carving does not preclude an early, even Romano British date…*" (Pickin 1993). It also raises the issue of votive objects in association with the well but as noted "…*this must remain a speculation until a closer date can be found…*" (Pickin 1993).

[35] Esp Green. Held by ASUD Negative 13/2

Conclusion

No evidence has been found to confirm the labelling of the section of road in the aerial photograph as Roman and highlights the importance of research such as the excavation and subsequent dating work carried out (see section 3.6). The issues surround the dating of roads are discussed in detail in section 3.6.1.

3.4 Documentary Resources

There are many documentary resources available to the archaeologist and this thesis draws on a range of different primary and secondary sources being held by regional records offices, online resources and libraries.

3.4.1 Historic Books and Texts

Historic texts were consulted and used where possible. These were most frequently associated with the re-use of Roman network for example, being lists of stopping points for carriers and discussions on the turnpikes (Harbin 1702; Hill 1702; Anonymous 1868). The legal documents referred to are from specialist secondary sources (Adams and Stephens 1930; Tanner 1930). The routes depicted on the historic maps are often detailed in travel journals and records such as Leland 1539-45; Harrison 1586; Fiennes 1888 giving veracity to the notion that the routes were used.

3.4.2 Mapping

In this thesis a large number of maps were consulted and utilised, these include (but are not limited to): first and second edition OS maps, modern OS maps, geology maps, and historic maps. Durham County Council's 'Definitive Map' of assigned footpaths and rights of way was also consulted. This map records the positions and statuses of the public rights of way within the county, a duty under the National Parks and Access to the Countryside Act 1949 (Oliver 2005: 21).

The historic maps used were: The Paris Maps (thirteenth century), the Gough map, Saxtin-Kip's 'Dunelmensis' (1607), Speed's 'Maps of the Bishoprick of Durham' (1610 & 1630), Mercator's 'Northumbria' (1635), Blome's 'Bishoprick of Durham' (1672), Morden's 'Durham Map' (1701), Bowen's 'Map of Durham' (1720), Morden's 'Episcopatus Dunelmensis' (1722) and Badeslades's 'Bishoprick of Durham' (1742).

Historic maps, whilst informative, are not always accurate, to scale, or created by someone who has been to the area in question, for example the Paris Maps were complied by a monk in St Albans who drew on not only contemporary travellers descriptions but also on those from Roman geographers (Mitchell 1933: 29). Many maps, such as the Gough map, named for Richard Gough who bequeathed the maps to the Bodleian Library in 1799, have unknown histories (Pelham 1933: 34). This can raise the interesting questions of for whom and for what purpose were they created. If travelling on roads is not why the map was produced, the roads may be only perfunctorily marked on a map or may be omitted altogether, for example the 1734 maps of Scottish and northern England's coast lines by John Cowley show only the coast lines (Withers 2002: 51).

In recent times there has been a move by historians and geographers to view historic maps contextually rather than as poor cartographic sources (Lloyd and Lilley 2009: 28). The Gough map is an interesting case in point, dubbed 'the oldest surviving road map of Great Britain' (Millea 2006: 5) the map has been the centre of the 'Mapping the Realm' project with a high resolution scan forming the basis of a GIS. In interdisciplinary approach to the study of the map was then employed with geographers, historians, cartographers, palaeographers and medieval linguists carrying out research into who made it and why through the 'language' of the map (Millea 2007: 4).

Work on the digitised Gough map by Lloyd and Lilley has been to study the distorted geographic space of the map. For example the Durham peninsula is very prominent and overall the detail is much greater in England than for Scotland. They conclude that the map was created from a *"composite of multiscale representations of places in Great Britain"* (Lloyd and Lilley 2009: 46). The question of whether the roads marked on the map were in use is harder to answer, narratives and itineries such as those by Leland 1539-45; Harrison 1586; Harbin 1702; Fiennes 1888 detail journeys along the routes depicted by the maps and so even if the maps are not cartographically accurate the idea that they are representative of the roadscape at the time is not far fetched and the idea that roads were used as the basis for the construction of some sections of the Gough map would suggest that they were not only in use but also local, regional and national importance (Lloyd and Lilley 2009: 45).

3.4.3 Documentary Resources

'Documentary archaeology' is a term coined in the 1980s by Mary Beaudry. It encompasses approaches which use diverse sources of documentary evidence to derive archaeological interpretations (Wilkie 2006: 13). This thesis uses documentary evidence to plot the routes, provide context to the use of the roads and, in chapter 7, to explore the role that roads had in the development of the home environment. The documentary record for County Durham is large, varied and held in many different locations.

<u>Record Offices</u>

Record office holdings in Northumberland, Newcastle Upon-Tyne, County Durham, Hartlepool, Middlesbrough and Redcar and Cleveland were used. Documents available at record offices can include items such as Manorial Court Rolls, Lay Subsidies, Quarter Session Papers, Inquisitions Post Mortem and Probate Records. Many documents were consulted and only those that have been cited in this thesis are listed in the Bibliography. They include but are not limited to: licences for drovers, oral histories, references to industry in Durham City, records pertaining to the properties belonging to the Bowes family and information about fairs in County Durham.

County Council Resources

A wide, modern documentary record is often available to aid archaeologists in their research; this includes the Historic Environment Records (HER). The HER is a data base which details standing buildings, spot finds, aerial photograph sites, sites of excavation and everything else of archaeological and historical importance, that has been found and recorded. Information contained within the HER includes map details, site type, status, condition and references used in compiling the entry. It is not exhaustive and items may be missing or unknown. Each item is accompanied by a six figure grid reference which allows them to be plotted onto Ordnance Survey maps giving an indication of the spatial relation of different site types and periods within an area. The references also allow for details to be checked and additional information on a particular area found. Whilst the basic HER is available online through Durham County Council Archaeology Section access was gained to the full records. Those used in the thesis can be found in appendix 2.

The Durham County Council Archaeology Section, was also the source of the items required to check the HER data and references. The resources included books, journal articles and more specialised resources such as overlays for the 1:10,000 maps of areas over which the aerial photographs had been taken and descriptive text and sketches for the spot finds, such as the Romano-British brooch found near the possible Roman road seen in aerial photographs of Esp Green[36], details of which would have been unavailable anywhere else. Some items however were unavailable; these included all references to the grey material excavation reports for excavations at Esp Green and the aerial photographs of the Esp Green site.

[36] See section 3.3.4.

The Durham County Council Natural Environment Regeneration and Economic Development department was used to obtain modern land use data. They also provided information relating to Dere Street running through Weather Hill Woods and ground truthing was carried out with Mr Lawson, one of the department officers in the summer of 2006.

As noted in section 3.4.2 the Durham County Council's 'Definitive Map' of assigned footpaths and rights of way was consulted, the paper copy is kept in the Access and Rights of Way department and as of February 2010 a digital version is available to consult online.

Archaeological Services, Durham University

ASDU holds aerial photographs for the county, filed by parish. None of those in the Greencroft parish folder matched those referred to in the HER with regard to identity codes. Features shown in the photograph negative 13/3 did however tie in with the description of the Esp Green 'U' enclosure, chapel and Roman road. The Low Allers photograph is filed under the parish of Stanhope negative 13/4.

Special Collection: Palace Green.

The Special Collection and Archives are housed inside the University of Durham's Palace Green Library. It is here that eight enclosure plans for the Lanchester area are kept[37]. The enclosure plans were consulted to see if any reference was made to the Roman road in the aerial photograph. Tithe map and apportionment records were also available for Greencroft. The part of the apportionment record detailing the land use, was not completed nor any reference to road or routeways made.

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[37] The enclosure of land was an important occurrence throughout the country during the seventeenth, eighteenth and nineteenth centuries. Enclosure of large areas of Durham happened during the earliest phase, associated with the growth of industry and population It was not until the late eighteenth century however that the remaining land, mostly upland, was enclosed (Rackham 1986; Muir 2000).

Beamish Regional Resource Centre

The Beamish Regional Resource Centre houses the collections of Beamish museum and the Tyne and Wear museums. It holds the unpublished work and illustrations on the lead routes such as Deane 1995. The Beamish Printed Book Collection was an invaluable resource in providing access to published books on lead mining, coal mining and the social history of the north east that were not available elsewhere.

3.5 Architecture

As explained in Chapter 2, architecture, and changes in architectural style and the social use of buildings, have been identified in this thesis as expressive indicators of the transformative capacity of roads in the transmission of cultural ideas. Archaeological resources are often seen as objects and remains that are buried. Standing buildings and the landscapes in which they are set do not fall into this 'buried' category and yet the methodology of their recording, conservation and their interpretation can all be carried out in an archaeological manner. An archaeological interpretation looks, not only at the style but also at the location, the stratigraphy and the social and economic background of the times in which they were built. These aspects of the buildings are then used to make inferences about the past, the inhabitants, the constructors, and the world in which they were living and to validate or question accepted socio-economic histories. Houses are not just groups of rooms but organised spaces providing a structure for everyday life (Hanson 1998: *i*).

In this thesis the architecture of three very different styles, 5 Framwellgate, Stang End Long House and properties belonging to the Bowes on South Bailey and Old Elvet, is presented. In each case information about the walls, roofing, glazing, current use, condition and surroundings were collected. Photographs were taken of each and a basic survey including scale drawings and an isometric sketch were created for 5 Framwellgate due to the more complex and readily visible timber frame.

Interpreting archaeological evidence and arriving at a conclusion about the society of the time must however be done with care, architecture does not control how people go about their lives and so we should not let purely architectural evidence control our interpretations (Hanson 1998: 77). It should be remembered that, "*…the relationship between social relations and spatial structures can only be understood through careful examination, involving both abstract propositions and concrete research of historically specific social structures.*" (Grenville 1997: 21).

3.6 An Archaeological Excavation at Lizards Farm, Lanchester

This thesis, seeks to redress the balance of the social and the functional ways in which roads are perceived. As will be discussed, in chapter 4, the construction of the Roman roadscape would have transformed the landscape, perceptions of space, the economy and society. Different people would have experienced it in different ways, some minimally affected by it and some culturally, socially and ideologically transformed by the roadscape and changes facilitated by it. The archaeological remains of this roadscape are both buried, as in the case of some sections of Roman road, and extant, for example where the original road no longer remains but where the preservation and maintenance of the route itself has been retained. Both can provide different information about the function, uses and ideologies associated with the network and can be used to investigate the past. One aspect of this, and other roadscapes, which has resulted in the marginalisation of these valuable and potent resources is the difficulty of dating the roads.

This thesis investigates ways in which to redress this. A section of Dere Street was excavated as part of a dating trial. Rather than relying on associated finds, place names or its shape, fills from the road, the ditch and the build up of contexts after its disuse were used to trial the application of selected dating techniques. Radiocarbon dating techniques have been used to date prehistoric wooden trackways (Godwin 1970: 65; Brindley and Lanting 1998: 45) but have not been widely used to date roads from other periods, either due to lack of suitable organic material, prohibitive cost or to the road not being of prime importance in the excavation. In this study radiocarbon dating [38] was used in a context other than prehistoric trackways and also luminescence techniques were applied for comparison.

3.6.1 Dating Roads

The dating of roads is, at the time of writing, a thorny issue. Specialists on the subject of roads, tracks and routeways accept that they are hard, if not impossible to date:

"…almost all the roads discussed in this book, …are virtually impossible to date…" (Taylor 1994: 163).

"…one serious problem…only rarely does field or archaeological evidence provide a date." (Hindle 2001: xiv).

Whilst it may be assumed that it is easier to date a Roman road, due to its characteristic structure and construction techniques here too caution is urged,

"…caution needs to be exercised unless there is some dateable evidence associated with the road to tie the structure to the Romans." (Davies 2002: 27).

Using the construction techniques, such as the use of metalling and the production of a camber, to identify a Roman road may seem justifiable as metalled roads in the periods before and after the Roman period through to the Post Medieval period are generally unknown. Roads from the Post Medieval period onwards are, however, frequently metalled and sometimes even purposely constructed to emulate the 'Roman style'(Davies 2002: 27).

[38] Carried out on suitable material found in a context forming part of the road's initial construction.

The need for 'dateable evidence' also highlights one of the fundamental difficulties with dating a road, the fact that it is often done through associated finds. These finds only indicate when the road was used, however, not the date of construction or the longevity of the road. There are rare examples of dateable artefacts being buried in ditches and within a road but it is thought that only five percent of Roman roads have any direct dating evidence associated with them (Davies 2002: 28).

More than 4,000 milestones have been found across what was once the Roman Empire. Rather than being small wayside markers that were the milestones for the Turnpikes in the eighteenth century, Roman milestones were often cylindrical or oval columns, set on a square base and up to four metres tall (Haines 2000: 55; French 1981). Milestones in the Roman period in some countries provide a good basis for dating them, in Judea along the Legio-Scythopolis road the frequent milestones have been used not only to accurately date the road but also identify the legion responsible for it (Issac and Roll 1982: 14-8). In Britain more than 8,000 miles of roads were constructed during the Roman period. From these thousands of miles only 110 milestones have been discovered[39] and these more regularly seem to commemorate a new Emperor rather than being an indication of when the road was built (Haines 2000: 56-7).

This national pattern of commemoration to new Emperors and subsequent re-use and/or loss is also seen in County Durham. At Stainmoor four milestones are recorded in the HER, one is a reference to a now lost milestone, recorded in 1760 and 1776 as bearing an inscription dating it to AD282-3, one is a milestone found in the 1927, it inscription now illegible and two were found in 1924, with probable dates of AD282-3 and AD276. At Lanchester a milestone reported as being re-used as a gatepost in 1783 has since been lost. In Greta Bridge the milestone recorded may have been moved from its original position. The remains of a milestone, found in

[39] And of these some are now missing (Haines 2000: 58)

1953, are recorded at Piercebridge with an inscription dating it to the early fourth century. The milestone recorded at Willington, was found in 1910. The inscription to Emperor Gordian III places it between AD238 and AD244 (Collingwood and Wright 1965; Keys to the Past 2009c). A map of the locations of these milestones can be seen in figure 7 and additional information regarding the inscriptions can be found in appendix 2.

Indirect dating techniques include the use of materials found at roadside sites such as settlements, the study of settlement and field names along a route and also documentary evidence (Davies 2002: 29; Wild 2002: 268; Hindle 2001: xiv; Jermy 1992: 228; Gelling 1978: 130; Hoskins 1955: 38).

Another approach is a morphological one. In his northern Mesopotamian case study Jason Ur used bands of hollow way widths, broad routes associated with the Bronze age sites and narrower routes with sites from the Byzantine and Early Islamic periods, to date the hollow ways in his wide study area (Ur 2003: 107). With roads in Britain those having long straight sections are often classed as Roman roads.

3.6.2 Archaeological Excavation at Lizards Farm, Lanchester: Summary

An archaeological excavation was carried out on a section of Dere Street at Lizards Farm, Lanchester, County Durham (NZ 415 548) in June 2004. The objective of the excavation was to find deposits, associated with a road of Roman age, that were suitable for the application of scientific dating techniques.

The farm is located to the north west of Lanchester and north of the site of the Longovicium Roman fort. In the spring of 2004 the land owner, Peter Robinson, had commenced a programme of trout lake development on the land to the east of the course of the Roman road. This involved the movement of large amounts of earth to an area to the west of the road. This scheme minimised the impact of the development on the Roman road which is still visible as an earthwork through the land.

3.6.3 Topographical, Archaeological and Historical Background

Lanchester village is sited in the valley of the river Browney, a tributary of the river Wear. The Lizards Farm site, on the outskirts of and to the north west of Lanchester Village, is located to the south of Stockerly Burn, a tributary of the Browney (see figure 8). The route of Dere Street Roman Road is clearly marked on the OS Landline map data heading through the field to the fordable confluence of the two local water courses, a common feature of Roman roads (Davies 2002: 88).

The geology of the area, like much of central County Durham, is that of carboniferous coal measures. The soil for the most part is either disturbed (i.e. developed in the form of buildings and industry) or made up of stagnogley soils with boulder clay drift and Lizards Farm, being on the valley floor, has some alluvial drift, over the boulder clay, making it good pasture land, and a good site for ponds, though the risk of flooding and waterlogging makes arable farming untenable (*pers. comm*. Robinson 2004).

It is a regionally important historic centre, best known for the well preserved remains of Longovicium Roman fort just to the south. The fort, built at a similar time to the creation of Hadrian's Wall, around AD 140, superseded Binchester fort (Vinovia), near Bishop Auckland and Ebchester fort (Vindomara) near Consett (Rowland 1974: 17). Its capacity has been calculated at approximately 1000 troops and its function was as a key part of the military supply network from York to Hadrian's Wall. The fort remains in a relatively good condition because it is on private land. The owners have prevented any local development and, although an extensive geophysical survey has been carried out, archaeological excavation data remain scant, with many theories and suppositions resting on information gleaned from the Roman materials robbed and re-used locally and an excavation that was carried out in the late 1930s (Reed and Austin 1976; Dixon 1987; Casey *et al.* 1992; Headly 1999, Bidwell and Hodgson 2009).

The area around Lanchester is not only rich in Roman remains, the Historic Environment Record (HER) for the locality also show great diversity, with finds such as bronze swords, arrow heads and a carved stone head[40]. Sites, to mention just a few, include deserted Medieval villages, a Post Medieval quarry, a seventeenth century hall and the nineteenth century remains of a tram way (Dixon 1987: 2).

Esp Green is a farm north west of the excavation. It is an interesting area as it is rich in crop marks of different periods for example a 'banjo' or 'U' enclosure, possibly prehistoric, the remains of a Medieval chapel and the vestiges of what is catalogued as a "Roman road" (Reed and Austin 1976: 216)[41] (see figure 6). Once rectified and plotted on the Ordnance Survey (OS) Landline data it is clear that this road crosses the OS course of Dere Street, running north east by south west and as previously discussed can not be confirmed as a Roman road (see section 3.3.4). There is no visible evidence in the aerial photographs for the route of Dere Street near to Esp Green[42].

There are several other entries recording evidence of Roman roads (sometimes referred to as Dere Street) in the Lanchester area and it is clear from the map that these all occur to the west of the OS plotted route of Dere Street. The position of the Lizards Farm excavation trench is also to the west of the predicted OS course and it is also reassuring that other sites both confirm, by alignment, this route as being Dere Street and support the trench's off set from the mapped course. Another example in

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[40] For the spread of these sites see figure 8.

[41] This report was prepared when the area around Esp Green, including a large section of Dere Street was under threat from the expansion of Castledene opencast coal mine. This growth has not, at the time of writing, yet occurred.

[42] It should be noted that the focus of the aerial photographs, however, is the chapel and enclosure and not either of the roads.

County Durham of Dere Street being off set from the plotted OS course is found at Weather Hill Wood[43], here the section of Dere Street is approximately 12m west of the predicted alignment (*pers. comm.* Lawson 2006).

The area to the south of Lizards Farm has been considerably disturbed by nineteenth century construction of railway lines, sidings, points and associated buildings. Opened in 1862 the line connected Durham to Consett Iron Works, and carried both goods and passengers until 1939 when buses took on the role of passenger transport. The trains continued to be used for transporting coal, timber, stone and livestock until 1965 (Dixon 1988: 48).

An examination of the land disturbed by the lake digging and soil movement yielded nothing of archaeological importance.

3.6.4 The Excavation

Durham County Council Archaeology Department were contacted to see if there were any suitable ongoing excavations that could provide access to Roman roads for luminescence sampling. There were no current archaeological excavations but the work on the trout lakes at Lizards Farm had required an archaeological survey before works could start due to Dere Street running through the site. On the advice of Lee White the land owner, Mr Robinson, was contacted and was found to be amenable to an excavation on his land.

The excavation was carried out over a period of six days with a team of between three and six people. The weather was changeable with heavy rain occurring on the

[43] The section that Dere Street runs through is owned by Mr Paul Martin, South Terrace, Esh Winning, Durham. A visual examination of the features and the Roman road was carried out by Gillian Hutton and Ged Lawson (A Durham County Council Natural Environment Regeneration and Economic Development department Officer) in the summer of 2006. This off setting is also apparent at Lanchester where geophysical survey by Archaeological Services University of Durham observed the course of Dere Street to the West of the OS plot (ASUD 2010).

penultimate day of the excavation. The location of this trench was chosen with reference to the OS map but also using the visible earthwork of the road in the field, and was designed to cover the top camber of the road and the ditch to the east. An area away from the on-site heavy machinery, associated with the creation of the fishponds, was chosen and a trench, approximately 2m by 12m was mechanically stripped using a JCB. The remainder of the excavation, recording and sampling was carried out by hand.

The site stratigraphy was complex and comprised many layers of predominantly yellow-brown sandy clays. Some of these ran continuously over the road's surface whilst others appeared in pockets. The starts of the ditch fills were found but the extent and depth of the ditch was not determined (see figure 9). The surface of the road was found at a depth of just over 1m. This had been created using between two and three layers of large sandstone cobbles (20 – 40 cm) packed in with smaller sandstone stones (5 – 15 cm) within a heavy clay layer with visible flecks of charcoal. Due to restrictions of time and labour a two metre long section was chosen for deeper excavation. Here the road surface was excavated in its entirety and revealed well defined ard marks cut into the natural of white clay (see figures 10 and 11). Two bulk environmental samples (12 litres) were taken of the fill around the road surface and the layer under the cobbles.

Once the excavation had been completed five samples were taken for luminescence dating, all in separate contexts, two near the road surface and three in the build up of deposits against the camber of the road leading to the ditch (because the extent of the far edge of the ditch was not found) (see figure 9). The samples were extracted using steel tubes, 5 cm in diameter, inserted into the horizontal face of the trench. These were then wrapped in light protective plastic and labelled to show which end was from the exposed section.

3.6.5 Chronological and structural interpretation

The excavated section of the road does seem to be of Roman construction, with ard marks demonstrating a prepared surface and local materials being used to form a solid and sturdy metalled surface. Excavations on the Stanegate[44] at Chesterholm and Walwick Grange, in the 1930s, revealed a road that was very similar in composition to the road excavated at Lizards Farm, with sandstone cobbles and clay as the core building materials and also of comparable dimensions (Wright 1936: 201; Wright 1937b: 185; Wright 1939: 145-6). A number of trenches, at a variety of locations, through the Devil's Causeway[45] , excavated in 1937, revealed surfaces that were considerably better preserved, though again "bedded down on the bottoming of clay". The superior preservation may be through less sustained use or its more remote location having minimised the robbing of materials (Wright 1938: 356). None of the reports from this period of intensive investigation[46] mention ard marks under the bottom layer of stone, and it is unclear whether all of the excavations removed all of the road's surfaces to reveal the sub-soil or natural.

Bidwell (1999), writing regarding excavations near Hadrian's Wall (in particular at Rudchester) has shown a clear stratagraphic correspondence between Pre-Roman agriculture in the form of cord rig[47] and the foundations of the wall. He hoped to *"…dispel the myth that ard marks found beneath the Wall might be connected with Roman clearance of the site rather than native agriculture…"* (Bidwell 1999: 10). The ard marks at Lizards Farm however are slightly different to those at Rudchester because the pattern cut into the natural is almost a cross hatch. More research is needed to support the idea that that where necessary the Romans prepared the ground but where it was already suitable for building they built straight onto the existing preparation that had been carried out by the native farmers.

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[44] The Stanegate was a key Roman route east – west from Carlisle to Corbridge and beyond, its eastern terminus being a matter of debate (Davies 2002: 172).

[45] The Devil's Causeway is a Roman route thought to start at Corbridge, heading for Tweedmouth (i.e. north east), through Northumbria (Wright 1938: 351).

[46] Archaeological reports from digs of this period on Roman roads include: Wright 1936; 1937a; 1937b; 1938; 1939.

[47] A narrow form of ridge and furrow

It is difficult to form a clear chronological picture or interpretation because no artefacts were found to support the scientific dating techniques and provide, at the very least, a terminus *post quem* (a date after which) such as the example of pottery sealed below the foundations of Dere Street near Piercebridge (Poulter 1998: 55) or a terminus *ante quem* (date before which). More recent work on the Stanegate has used the construction of forts along its route to try to date the construction and phases of use of the road (*ibid*: 54).

3.7 Post Excavation Work

As mentioned in the introductory chapter, the archaeological investigation of roads in Britain through excavation has been limited. One of the main discouragements to such undertakings has been the inability to date road surfaces accurately and independently of artefactual associations. Consequently, it was decided that a trial using scientific dating techniques on excavated samples from a known section of the Roman road of Dere Street within County Durham, at Lizards Farm, Lanchester, would be carried out as an integral part of the present research. It was hoped that, if the results proved successful, a methodology might be derived for the analysis of roads of other and unknown periods.

The methodologies deployed during the post excavation work for the radiocarbon sample, the five samples taken for luminescence testing, and the subsequent samples from a core from additional field work, are presented here.

3.7.1 Radiocarbon Dating

The environmental samples were processed using the floatation technique from contexts from the Lizards Farm excavation. The sample from context 416 (see figure 9), the road surface packing which had some charcoal visible, yielded enough charcoal for C14 testing.

Dr Charlotte O'Brien at the Biological Laboratory (Department of Archaeology), University of Durham assisted in the selection of suitable charcoal fragments[48] to be sent to Beta Analytic Inc. (Miami USA) for dating tests. Accelerator mass spectrometry C14 dating was selected as the sample size was small[49].

The sample was pre-treated using the "acid/alkali/acid" technique commonly used for charcoal, textiles, wood and some sediments and peats. This involved the crushing and dispersal of the sample in deionised water then its treatment using acids and alkalis. Hot HCI was used to remove any carbonates then NaOH to eliminate any secondary organic acids. A final acid wash was then administered to neutralise the sample before it was dried. The sample was then reduced to 100% carbon i.e. graphite and carbon isotope concentrations measured using an accelerator mass spectrometer (*pers. comm*. Hood 2004; see appendix 4).

3.7.2 Luminescence Dating

Luminescence dating is a term which covers several techniques. Thermoluminescence (TL) and optically stimulated luminescence (OSL) are the two main methods, but each of these too can be implemented in a variety of ways. The techniques rely on the fact that materials with a crystalline structure contain defects that are called 'electron traps' because they attract free electrons. These 'traps' fill up over time as the action of ionising radiation releases electrons within the crystals. These electrons are stored until they are exposed to light (OSL) or heat (TL). In archaeological terms this means that artefacts such as pottery and bricks can be dated as the firing process 'zeros' the clock mechanism so that the date of firing can be determined, using TL. Sediments with a quartz component that have been exposed to sunlight to zero them and then buried can be dated using OSL (Aitken 1990: 141-3).

[48] Some of the floatation material was coal and therefore removed from the potential dating sample.
[49] AMS is a technique which measures the concentration of C14 isotopes. The radiometric technique counts their radioactive decay. For more detailed descriptions of these standard methods see Aitken 1990.

This latter technique was used for the five Lizards Farm samples, the locations of which can be seen in figure 9. The tests were performed during 2004.

For luminescence dating it is essential to take into account the burial or local surroundings which affect the amount of radiation received. For samples of brick this may mean leaving a 'dose meter' in situ to measure the dose rate over several months. The limited duration of the dig at Lizards Farm dig meant that dose meters could not to be left in situ and so conditions were tested using a portion of the sample taken.

<u>Methodology</u>

For each of the five samples the following sequence of preparation and testing was carried out. The values given are those for the initial tests. Subsequent runs were carried out using different values, refined at each stage by numerical analysis and examination of the data.

In subdued red light conditions a portion of material (4-5 grams) was extracted from the sample tube for the determination of water content and then a sub sample of approximately 10-15 grams was taken for OSL preparation. After drying, four fractions were removed by gentle disaggregation in a pestle and mortar and sieving, $\leq$ 90 µm, 90-150 µm, 150-355 µm, $\geq$355 µm. Each fraction was then weighed and stored in light protective containers.

The 90-150 µm fraction was then treated (etched) in 40% hydrofluoric acid for 45 minutes, removed the non-quartz component and the outer surface of the quartz grains. The success of this procedure was checked under an optical microscope. The etched sample was then sieved to remove any particles less than 90 µm. Material was then evenly deposited onto the centre of stainless steel disks in aliquots of approximately 1 mg.

OSL measurements were conducted using a semi automated Risø reader. Optical stimulation was provided by a filtered tungsten-halogen lamp, giving stimulation in the wavelength range 420-550 nm. The luminescence was detected by a photomultiplier via two U340 filters of 5mm thickness. The luminescence measurement was made and plotted with the aliquot held at 125 degrees Celsius over a period of 100 seconds. A calibrated ^{90}Sr/ ^{90}Y β source was used for irradiation of the samples, giving a dose rate of 0.397 Gy per minute. A pre-heat of 220 degrees ^{o}C for 10 seconds was applied to remove any unstable charge. The initial sequence was run twice to enable the study of the sensitisation.

The measurement sequence:

Pre heat to 220^{o} C at 2 ^{o}C per second
Measure OSL at 125 ^{o}C for 100s
Beta Dose B1
Pre heat to 220^{o} C at 2 ^{o}C per second
Measure OSL at 125 ^{o}C for 100s
Beta Dose B2
Pre heat to 220^{o} C at 2 ^{o}C per second
Measure OSL at 125 ^{o}C for 100s
Beta Dose B3
Pre heat to 220^{o} C at 2 ^{o}C per second
Measure OSL at 125 ^{o}C for 100s
Beta Dose B1
Pre heat to 220^{o} C at 2 ^{o}C per second
Measure OSL at 125 ^{o}C for 100s

The outcome of these procedures led to the exclusion of samples 1 and 2 as they were found to be unsuitable. The remaining samples had weak signals and so an alternate OSL technique, infra-red stimulated luminescence (IRSL), was tested. This technique uses the fine grain (2-10 µm metres) component including both feldspar and quartz. It has the advantage that the signal from feldspars is brighter that that of quartz and that it requires shorter exposure to sunlight for the zeroing process. It is therefore a useful technique for poorly bleached sediments (Aitken : 1). Since the IRSL also yielded weak signals and more variable decay curves, OSL was judged to be the most appropriate method for these samples, albeit with weak signal intensity.

One of the main limitations of the Lizards Farm excavation was the fact that the full extent of the ditch was not found. To test the hypothesis that the ditch material may provide better dating samples, vertical cores working east from the original trench were taken on a further visit to the site. This technique allowed the investigation of the ditch to its maximum depth without requiring a full excavation. A test core from the centre of the ditch was then selected (see figure 12) and the four most suitable contexts chosen for dating (for a description of the core see appendix 3). The OSL results again, however, indicated that full zeroing had not taken place and so it was decided that, due to time and resource constraints, testing should stop. Although the luminescence dating did not prove to be suitable on this occasion, advances in the OSL measurement techniques, in particular single grain detection, may allow successful dating in other road contexts.

3.8 *Dating Results*

3.8.1 Radiocarbon Dating Results

The results from the C14 tests gave a date range of 500 BC to 380 BC [50].

The results were:

Measured radiocarbon age: 2350 ± 40 BP[51]

Conventional radiocarbon age 2350 ± 40 BP

2 Sigma calibration: Cal. BC 500 to 460 and[52] Cal BC 430 to 380

The conventional radiocarbon age was determined after applying $\delta^{13}c$ corrections[53] (Hood 2004). A graphical plot of these results can be seen in appendix 4.

These results are interesting because they predate the widely accepted date for the construction of the initial phases of the northern sections of Dere Street of around AD 80 (Rowland 1974: 15). An explanation for the early date is that the charcoal was contained in the clay before the Romans used it in the road construction, and that the charcoal may have been from a tree of a significantly greater age than the construction of the road (Aitken 1990: 58).

[50] Laboratory Number: Beta-193987

[51] BP: Before Present meaning before 1950.

[52] There are two possible dates due to the fluctuating nature of the radiocarbon calibration curve for this period in history.

[53] Radiocarbon dating relies on the principle that the carbon-14 fraction of any living entity decays at a know rate after its 'death'. For C14 this is a decrease rate of 1% every 83 years, giving it a half-life of 5730 years, i.e. it takes 5730 years for the amount of C14 to be halved (Aitken 1990: 56-7).

3.8.2 Luminescence Dating Results

The OSL results were:

Core 1: Unsuitable for Dating;
Core 2: Unsuitable for Dating;
Core 3: c. 1000 years old (Medieval);
Core 4: c. 10,000 years old (Early Holocene);
Core 5 c. 6,000 years old (Mid Holocene).

These results show that the materials deposited on the road surface were not sufficiently zeroed at deposition to provide a reliable date for the construction of the road. The result for core number 3 indicates that the ditch deposits (where they are dateable) may provide a better environment for "zeroing". These results highlighted the need to create a methodology to test the suitability of the sample for the luminescence process. Analysis by thin section to assess the distance travelled, the sorting and weathering of a sample could be a possible avenue for refining the technique for selecting samples for dating. Analysis under the microscope for these factors, however, has not revealed a definitive sample type that is preferable. For example sample 5 has a wide range of particle size, no sorting, no rounding, some cementing and uniform mineralogy suggesting short distance transport and rapid deposition in a single phase. Sample 1 showed more weathering, better sorting and a smaller size range which could perhaps be taken to suggest an increased likelihood of zeroing and yet this sample yielded no result.

The results from the dating techniques used provided a salutary lesson in dating techniques and reveal complexity of the sediment deposition process associated with the road and the need for specialised assessment of the suitability of potential dating samples from contexts of this type. It is clear that not only is an appreciation of the limitations of each dating technique needed but also an understanding of how the dates are derived.

3.8.3 Conclusion

This feasibility study into the excavation and dating of roads has created more questions than it has solved. The concept of dating the roads themselves is a valuable one and the production of a workable methodology has been achieved. Roads and routeways currently remain an under-used and under-valued resource, in large part because of the difficulty of dating them accurately and confidently. The development of this methodology is likely to be time consuming and dependent on advances in the field of luminescence research. Whilst the dating of the samples proved to be problematic this does not undermine the value of the work. Once completed, a systematic scientific dating approach, in combination with the current archaeological techniques, will provide an invaluable tool for archaeologists.

3.9 Chapter Conclusion

The methods and techniques analysed and reviewed here are broad-ranging due to the scope and the interdisciplinary nature of this thesis. The time frame and the types of road and routeway discussed and analysed in chapters 4, 5 and 6 are also broad ranging and diverse, providing a much needed holistic approach to the roads and routeways of County Durham.

"All right, but apart from the sanitation, medicine, education, wine, public order, irrigation, roads, the fresh water system and public health, what have the Romans ever done for us?"

(Reg in 'A Life of Brian': Jones 1979)

4 The Re-Use of the Roman Road Network

The premise of this chapter is that re-use of the Roman road network after the Roman period formed a basis upon which the road network used in the period 1530-1730 could flourish. The chapter therefore argues a context for the Roman road network itself, as well as its Post Roman fate and development, and the particular background to the extent of re-use and modification in the sixteenth to eighteenth centuries. Given the importance, therefore of the Roman roads the factors influencing the placement of the original Roman road network and the reasons for their continued use in the Post Roman periods form the core of this chapter. The GIS mapping of these routes within this chapter concentrates on the Roman routes which were retained as parts of later transport networks to enable the comparison of slope and distance with the other route types, for example their possible similarities to other broad scale networks such as the drove routes and the Turnpike roads and the distinction between this network and those developed for specific industrial requirements such as the lead routes.

This thesis does not aim to offer a detailed history and assessment of the Roman road network during the Roman period, being rather an overview of the aspects from the Roman period which have influenced their continued use in the Post Roman periods. These include the factors involved in the initial placement of the system, their construction and their usage.

It seems quite clear that one aspect of the re-use of the Roman road network was that of continued military and strategic utility: factors exemplified in the initial battles of the Norman Conquest (1066) when it was necessary to move cavalry and foot soldiers swiftly from one end of England almost to the other. In 1066 it was the ability of Harold's army to move swiftly that aided his victory over the Viking and Norwegian forces at the battle of Stamford Bridge, near York. It took Harold and his men only four days to march the 185 miles from the south of England where they had been waiting for William and his army. The awaiting Viking army had expected Harold's journey to take twice as long and were therefore woefully unprepared, with much of their armour on boats in a different location (McCord and Thompson 1998: 19). It is important to note that Stamford Bridge is located on a Roman road and that the majority of the route taken by Harold from the south to York was along the alignment of the Roman road network.

The military benefits of the network remained into the early modern period, and the impact of this network on the location of Civil War (1639-51) sites will be considered later in this chapter.

For the most part the types of re-use of this system that will be considered here are broad scale, such as those which facilitate the movement of goods, materials, post and the coaching transport system.

The Roman road network, and its re-use within County Durham, is addressed in terms of[54]:

- the purpose and rationale behind its creation and use;
- the ideology of the road
- their usage and the transport used and any additional requirements imposed by any changes that occurred over time;

[54] The same structure is used in chapters 5 and 6.

- their creation, whether the route was designed or created ad hoc, or whether it was a pre-existing route that was adopted;
- their physical characteristics and maintenance;
- their effect on the local environs, society and economy;
- the road and the roadscape as extant and as buried artefacts.

GIS analysis of the Roman roads in County Durham, including least cost distance analysis, has been used to establish the primary concerns for the routing of the Roman roads, using aspects affecting the cost grid such as slope and distance. In addition to these specialised investigations each Roman road and its least cost path have been analysed and compared, using GIS and Excel in terms of changes in elevation and slope.

4.1 The Roman Road Network

A great deal has been written about the Roman roads of Britain and Europe (to highlight a few broad ranging publications: Peel 1971; Margary 1973; Sitwell 1981; Bagshawe 1994; Vermeulen and Antrop 2001; Davies 2002; Staccioli 2003. In addition to work with the expansive theme of 'Roman Roads' there are also many works which look in detail at very small sections of the network and specific routes: Bellhouse 1957; Viatores 1964; Rowland 1974; Brinklow *et al.* 1986. Whilst most deal with the construction, technology and locations of the Roman network some authors have concentrated on associated aspects such as Van Tilburg 2007, who looks at traffic and congestion and Laurence 1999; Adams and Laurence 2001 who look at the travel which the roads facilitated and the cultural change this effected.

4.1.1 Purpose and Rationale

The purposes of the Romans expanding their Empire can be viewed as political, economic and ideological. At a political level a victory in battle and the subjugation of another nation brought prestige, increased power and influence. Economically the conquering of another country brought new land for exploitation and new subjects to tax for the benefit of Rome and the Empire. From an ideological perspective the Romans believed it was their 'destiny' to bring civilisation to people (Taylor 1994: 41).

The purpose and rationale behind the creation of the Roman road system in Britain, in the first instance, was the military need to have the ability to move troops effectively and efficiently across the country as its primary need. In addition, the road network provided the Romans with a better geographical understanding of Britain. Locations could be more clearly defined as being a certain distance or time from each other. From an ideological stand point, the construction of a road clearly demonstrated not only the dominance of the Romans but also the unity and extent of their control and their supremacy in engineering and technology (Davies 2002: 11). The comprehensive network of roads across Britain and the rest of the Roman Empire was then needed in order to make effective long term governance possible (Adams 2001: 1).

A criticism that has been levelled against the study of roads is that too often the studies are confined to functionality, economics and engineering. This functionalist approach is set against the increasingly interpretive study of landscapes. Roads are a component of the landscape, and yet whilst the landscape is seen as subjective, roads are viewed as clear-cut. Witcher argues that these opposing approaches create an *'…artificial division between the function of roads and the ideologies they embody…'* (Witcher 1998: 60). The ideological motives of the Romans in their creation of their road system in Britain should not therefore be seen only as secondary or tertiary to the militaristic and economic drives because the *'…practical and everyday should not be conceived of as the opposite of the ideological – the two are synonymous…'* (Witcher 1998: 60).

In the case of a conquered country, such as Britain, the response of the natives to the roads and the motives for their creation may have been different to those of the builders. Whilst to the Romans the construction of roads for military, geographical and economic purposes and their imbued ideologies of the subjugation of a landscape and the bringing of civilisation to the people, were well developed acts with explicit and subconscious meanings and functions, to the local population these acts and their more subtle meanings would be new. Indeed the more subtle ideological perspectives of the Romans may not have been appreciated by the local populace at all, and the roads and the appropriation of the landscape may have been taken only at 'face value', in the first instance for military, and eventually for commercial purposes (Witcher 1998: 66-7).

The length of the Roman occupation of Britain (which was over 400 years) means that the same road at the end of the period would have had very different meaning to when it was created. The exchange of cultural ideas, customs, ideologies and development of a 'Roman Britain' which took place over this time led to a hybridization, especially amongst those in the higher echelons of society (Loveluck 2002). The socially, temporally and spatially influenced modification of both the 'native' and 'Roman' interpretation and view of the Roman road network is only part of the complex theme of Romanisation[55], which is outside the scope of this thesis but is discussed further in Haverfield and Macdonald 1979; Millett 1990; Wood and Queiroga 1992; Woolf 1997; MacMullen 2000; Curchin 2004 to mention only a few of the many apposite sources.

A second criticism is that most approaches to roads *'…conceive…of roads as patterned entities articulated within the context of strictly Cartesian space.'* (Witcher 1998: 61). An example of this can be found in the article by an historical geographer, Dicks (1972: 10) which applies the basic procedures of a simple network analysis to the study of the locational significance of Roman London and to isolate certain

[55] Also written as Romanization.

aspects of the primary role which London held in Roman Britain by exploring the use of 'path ordering analysis'. His aim was to bring 'fresh techniques' to the study of historical transport networks using techniques developed for physical geography (Dicks 1972: 4). This article created much debate, Langton *et al.* 1972, questioning the use and application of 'progressive' techniques, the sources used and the conclusions drawn but not its 'strictly Cartesian' perspective.

4.1.2 The Ideology of Appropriation

The assertion of Williams-Freeman that *"…the pre-existence of a British track along the direction of a Roman road seems to be the rule, rather than the exception."* (Williams-Freeman 1918: 220) is a contentious one. It seems likely that the invading army would have followed existing routes and there is some evidence that in the first instance the Romans used and improved the Iron Age routeways already in existence (Davies 2002: 147), for example the long distance tracks such as the Jurassic Way and the Icknield Way, in the first phases of their advancement because waiting for the surveying and construction of a road engineered 'from scratch' would not have been realistic (Peddie 1997: 122). There is, however, a distinct difference between campaigning and the creation of a network to maintain control. The system created for these later purposes can be shown, in some places, to follow previous routes but this is not *"the rule"* (Davies 2002: 113). Despite this it must be remembered that people moved around before the Romans arrived, often with highly sophisticated transport networks incorporating water and land communications (Cummins 1979: 11; Taylor 1994: 3).

The appropriation of existing lines of communication was in some places combined with requisition of significant local defences such as the re-fortification of defensive dykes at Camulodunum, Colchester, during the Roman period and the enhancement of defences at Hod[56] Hill, a substantial hill fort in the Blackmoor Vale, Dorset

[56] Sometimes Hodd Hill.

(Hawkes and Crummy 1995: 57-9; Richmond 1968). Alongside re-use there are examples of Iron Age settlements being demolished for the area to be re-used for a Roman fort, for example at Hayton, where the settlement was cleared and new field boundaries were established following the line of the new Roman road (Ramm 1980: 33-38).

The ideological impact of either the destruction or the occupation and re-use of sites which were once native places and symbols of power and control would have been two sided. On one hand the Romans were realising their 'destiny' and demonstrating their power dynamics of cultural domination over the landscape and people. On the other hand the indigenous population were seeing the replacement of their ideals and the loss of not only physical monuments and sites but also their sense of space and place (Witcher 1998: 67).

4.1.3 The Creation of a Network

Margary asserts that the Roman roads were laid out as a carefully planned network (Margary 1973). The more popular current stand point is that the system was developed a little at a time (Hindle 2001: 13). Considering the fact that the north of England and Wales were not fully under Roman control until AD 80, more than 45 years after the initial invasion, the envisaging and implementation of a grand master plan seems improbable. It is more likely that each section of the network was planned and created for the requirements of the then current phase of the Roman occupation.

The creation of a network by which supplies and troops could be deployed would have been a priority of the Romans, the initial phases of road construction would have followed[57] the campaigning army and Dere Street running north-south through County Durham is an example of this. Then additional development of the system,

[57] The roads created would not strictly 'follow in the footsteps' of the routes chosen by the campaigning army rather an optimum route would be chosen later by the road surveyors and builders.

through the improvement of the roads and by increasing the number of routes to give adequate coverage of an area would have occurred. For example the Stanegate[58], running east-west from Carlisle to Corbridge is an example of this. After the establishment of the limits of the territory the road network to support the control of this territory would have been created. The Military Way running parallel to Hadrian's Wall is an example of this. Davies defines these phases as 'penetration roads', 'territory-holding roads' and 'frontier-support roads' (Davies 2002: 115). A fourth phase would have followed in some places, that of development and use for economic purposes, later roads, particularly in the south east of England for example, were constructed for economic reasons (Johnston 1979).

The central claim of Davies' article on the 'Designing of Roman Roads' is that the Romans used land surveys and maps as integral parts of the road design process (Davies 1998). This is in stark contrast to Margary who states that *"…no maps or compasses were available to them…"* (Margary 1973: 17). Whilst he concurs with Margary that the Romans were unlikely to be familiar with a magnetic compass, Davies argues that a sundial would have provided a method of assessing north south directionality (Davies 1998: 2).

Davies suggests that:

> *"We should begin by asking not how the Romans built such straight lengths of road but why? Far from being the convenient way of linking high points, the whole business seems so complicated, tedious and even dangerous, that it is fair to ask: 'Why bother?'."* (Davies 1998: 5)

Davies makes a case for the possibility that "*…the straight sections are not part of the planning process at all, but the outcome of it…*" and that *"The required information*

[58] Dere Street and the Stanegate will be discussed further later in this chapter.

on bearing, along with other geographical data, would have been obtained by surveying and map-making." (Davies 1998: 5).

If this was the case then there would have been two distinct roles, the surveyors who collated information about the local geography, the required bearings and route requirements and the engineers who built the roads to the surveyors specifications (Davies 1998: 5). This division of road creation into planning and execution would seem to be supported by primary documentary evidence discussed in Dilke 1967.

4.1.4 Physical Characteristics and Maintenance

County Durham had five major Roman roads: two routes running in parallel north-south; one running east-west and two smaller sections, one joining the east-west route to the north-south system and one connecting the two parallel routes (see figure 7). Of these Dere Street is the most well known, it runs further inland than the other north-south road, and connects Piercebridge, Binchester, Lanchester and Ebchester. It is thought to have been the primary route as well as the 'penetration' road because excavations at Piercebridge, County Durham, show Dere Street to be substantial in construction and width, it being 8.4m[59] across (Rowland 1974).

The additional north-south route was a later development associated with a fort at Chester-le-Street. This route is also known as 'Cades Road'[60] Although the existence of a Roman road linking York and Newcastle running through County Durham to the east of Dere Street was acknowledged it was John Cade of Durham who, in 1785, lay down his ideas for the details of its route. Other routes for this road have been suggested and it is the course outlined by Crawford, using the Ordnance Survey data that has formed the basis for the mapping in this thesis (Keys to the Past 2009b). The route running west-east through County Durham, linking Brough with Bowes and

[59] 28 *pedes* or Roman feet (Hutchinson 1972).
[60] In Durham County Council resources 'Cades Road' is used without a possessive apostrophe.

connecting to Dere Street at Shildon, is classified by Davies as a 'territory-holding' road.

For clarity, in this thesis these roads have been numbered from 1-5 from west-east, (see figure 7). The Margary road numbering system is commonplace throughout the literature and to facilitate comparison:

- Roman road number 1 is Margary 82 and 820.
- Roman road number 2 is Margary 82 from Bowes, heading south.
- Roman road 3 is Dere Street, Margary 8c and 8d.
- Roman road 4 is the connective route from Roman road 3 to Roman road 5, Margary 83
- Roman road 5 is Margary 80a and 80b (also known as Cades Road).

Just as the route of Cades road has been debated, so too have the origins and routes of other key routes in the north east. For example Bidwell and Snape (2002: 256-9; figure 3) propose that:

- Margary route 806, the Wrekendike and South Shields fort were all pre-Hadrianic in origin;

- Margary route 806 perhaps Flavian, crossed Tyne at Newcastle and continued north to Devil's Causeway, a little to the south of the River Coquet (this was first suggested by Hafemann 1956, 150).

- That the Stanegate route extended along the north side of the Tyne east of Corbridge (would have provided a link between the known Stanegate and South Shields fort allowing goods brought by sea to be taken along the Stanegate fort chain).

Morphologically Roman roads are characteristically straight. This is not to the cost of functionality and if following a river or ridge line then the road is correspondingly comprised of bend and curves. The 'text book', 'ideal' Roman road is divided into two types, a 'main highway' and a 'normal highway'. Each of these types would have had drainage ditches on either side.

A 'main highway' is described as having four layers:

- A foundation layer, 20-30 cm thick of flat stones.
- A second layer, 30-50 cm thick of stone blocks set into mortar.
- A third layer, 30 cm thick of crushed stone set into concrete.
- A fourth, top layer of cobble of flat stones set into mortar (Hill 1984: 83).

The 'normal highway' is again having four, slightly different, layers:

- A bottom layer, 20-30 cm thick comprised of mortar on top of coarse sand.
- A second layer, 30-50 cm thick of stone slabs and blocks in a cement mortar.
- A third layer, 30 cm thick of crushed stone set into concrete.
- The top, fourth layer, of gravel and concrete (Hill 1984: 83)

The width of the roads varied, wider for more important highways and narrower where substantial engineering works were required or where traffic flow would be minimal. In Britain there has been variation in the definition of the 'road width', this is sometimes taken to be to the outer extent of the ditches, the slope of the *agger*[61] or the metalled surface. It is now generally accepted within British archaeology that the road width is the extent of the metalled surface. In Britain the average width of the metalling is 22 *pedes* or 6.51m[62] (Davies 2002: 73). The most frequent widths are between 15 and 20 *pedes*, with 15 and 20 being the most common widths suggesting that the Roman road builders did, to some extent, use standardised widths (*ibid*: 74).

[61] The raised mounds beside the ditches of material excavated from the ditches. Often used as an indicator of Roman origin (Margary 1973; Davies 2002).

[62] *"…based on a sample of 488 sites…for which excavations have enabled the full width of metalled surface to be established."* (Davies 2002: 73).

It has been estimated that the total length of the road network of the Roman Empire was about 50,000 miles and so there would have been variation both in the construction and the materials used across the network depending on available resources and requirements (Hill 1984: 84). Not all roads would have been built to 'text book' specifications. The first phase of 'penetrative roads' may have been unmetalled and smaller connective routes may have never been metalled (Davies 2002: 116). Roads in different areas would have been built with materials to hand, although stone or gravel may in some instances, where no suitable supplies were available locally, have been transported for a few miles (Hill 1984: 82).

The work was not confined to the road itself, in a description by Statius (a poet in the time of Emperor Domitian AD 81-96) the work alongside the road is portrayed:

> *"Many hands work outside the road itself. Here trees are cut down and the slopes of the hills are bared; there the pickaxe levels the rock or creates a log from a tree; there clamps are driven into the rocks and walls are woven from slaked line and grey tufa. Hand driven pumps drain the pools formed by the underground water and brooks are turned from their course."*
> (Forbes 1934: 139).

Roads are seen as discrete objects but this work on the 'roadscape' would have transformed the landscape dramatically. The razing of areas alongside of the roads and the subjugation of nature itself in the re-directing of water ways would, perhaps, have symbolised and confirmed to the natives their own subjugation. In addition the civil engineering feats of bridges, aqueducts and public buildings would have left little doubt as to who had superior technological skills.

Native and veteran colony involvement in the creation and maintenance of the network in a later phase of its use is evidenced on a Lincoln milestone, dating from the reign of Valerian (AD 253-259) and stating 'the municipality of Lindum set this up' (Haines 2000: 57-8).

4.1.5 Gradients on Roman Roads

"Amount of inclination to the horizontal; degree of slope." (OED 2010).

Gradient or slope is the rate at which a road rises or falls over a given distance. It is often measured as the horizontal distance needed to give a change in elevation of one unit[63]. For example a ratio of 1 to 5 is a steep gradient as there is a rise of 1 unit for every 5 units travelled whereas a ratio of 1 to 50 is a gentle slope as for 1 unit change in elevation 50 units of distance are travelled. It is also possible to express the gradient by measuring the actual distance that would be traversed on a road rather than the horizontal distance. In addition gradients can also be written as percentages, 1 in 5 would be shown as 20%, 1 in 50 would be 2% (Davies 2006: 105).

Two components affect the ease with which something will move along a road, gradient and resistance. A heavily loaded cart going up a steep hill on soft ground will be a lot harder to move than a heavily loaded cart going down a steep hill on hard ground[64]. Figures for allowable and optimum gradients were investigated by Thomas Telford in the early 1800s. His background in canal construction meant that he was aware that it was possible to reduce and finely control gradients over a transport system but that these refinements to the landscape were expensive. His objective was therefore to balance the cost of construction with the improvements that these works

[63] The unit used makes no difference as the gradient is expressed as a ratio.
[64] Indeed effort may need to be expended to slow the cart down. At Blackstone Edge on the Lancashire/Yorkshire border there is a well preserved Roman road with a central trough. One hypothesis for this trough is that it was created by poles used to slow carts down on the steep decent (Morriss 2005: 113).

created to the transport system. For a horse drawn waggon the ideal slope was calculated to be no more that 1 in 70 where the surface was hard and 1 in 15 where the surface was gravelled. In contrast to these 'ideal' slopes the Roman road builders only minimised the gradient through cuttings, embankments and other techniques if the slope was greater than 1 in 6, substantially steeper than the ideal slope calculated by Telford and his assistant (Smiles 1904; Landels 1978; Davies 2006: 107; Davies 2002: 79).

As the Roman roads were designed to take wheeled and animal drawn waggons the directness and the distance of the route seem to have taken precedence over ease of the journey. Two possible explanations for this are:

- that speed for the waggons was not paramount, *per se*, but the ability to deploy troops rapidly on foot meant that the shortest, most direct route was preferable;
- that the waggons were only expected to go slowly so the additional effort in climbing and descending was not to the detriment of the expected speed (Morriss 2005; Davies 2006: 107).

4.1.6 Usage

The width of the road would have been a factor in the type and quantity of traffic that it could carry. Work had been done by Landels 1978; Tsujimura 1991; Piggot 1992 on the widths of carts[65] and wheeled vehicles[66], which varied during the Roman period. The average width of a wheel base of a cart was 4 ¾ *pedes*, and when allowance for wheel hubs is added the width of a cart increases to around 6 *pedes* (Tsujimura 1991: 60-1 and Piggot 1992: 34-6). A minimum of 12 pedes was therefore required if two carts were to be able even to pass each other.

[65] The word cart is generally, but not exclusively, used when referring to two wheeled vehicles.
[66] Both 2 and 4 wheeled vehicles were common

Another consideration is the turning circle of the vehicles. The bigger the turning circle the wider the road would have needed to be for the vehicles to manoeuvre. Tsujimura's study of the traffic system of Pompeii through the study of the ruts in the streets found that when vehicles turned from one street to another the width of the road required increases, and the sharper the turn the greater the increase in width required (Tsujimura 1991: 74-5). It is not known for certain whether Roman four wheeled vehicles had fixed or movable, by means of a swivel table, front wheels, or indeed how the wheels were mounted onto the axle, both of which factors would have affected their turning circles. Four wheeled vehicles with fixed front wheels would have needed a considerably wider road in order to negotiate corners and bends as would vehicles with wheels closely fixed to the axle (Landels 1978: 179-180).

Illustrations from the Roman period do not give any indication of the axle fixings. The proportions of the vehicles in the surviving Roman illustrations suggest that they were often short; this being so it has been postulated that the short wheel base could possibly be a design feature to compensate for fixed front wheels. This would allow the vehicle to be hauled round the corners rather than requiring the finer engineering, and associated costs and maintenance, of movable front wheels (Landels 1978: 180).

Whilst the hauling of a vehicle around a corner may have been practicable for a light load in a two wheeled cart, the additional width of road required by a vehicle with a heavy load pulled by a train of animals being dragged around a corner over a rough cobbled surface would have been substantial. This would seem to suggest that either front wheels that could swivel were used or that on some routes no turning was required.

A road width of 15 pedes, as found frequently in Britain, would have been adequate for two carts to pass and to manoeuvre around most bends and corners whilst the average width of 22 pedes would have facilitated the use of the road by increased traffic so that carts could be easily joined by pedestrians and pack animals and still have room to manoeuvre (Davies 2002: 69, 73).

The use and development of the Roman road network and the associated forts in the north of England for military deployment is extensively covered in Breeze and Dobson 1985. In County Durham, Roman road 3[67] and Roman roads 1 and 2 were in place to serve the military needs of the north east from around AD 85. Roman roads 4 and 5 were in place from AD 170 as the abandonment of the area south of the Antonine Wall in Scotland and a drawing back of many troops to south of Hadrian's Wall in the 160s meant that, as there was inadequate space for them along Hadrian's Wall additional regiments were placed along the routes in the north. In County Durham this led to a new fort and additional lines of communication being built, the new fort at Chester-le-Street on the additional Roman road 5, linked to Roman road 3 by Roman road 4 (Breeze and Dobson 1985: 5, 11, 12,18).

The Romans travelled not only for military purposes but also for business and recreation. Their mobility increased their social standing, in much the same way as foreign travel does for us today (Haines 2000: 55). There was not an equivalent to the passenger carrying coach services of the nineteenth century and any personal travel would have been done on an ad hoc basis or with personal transport rather than through a timetabled service (Laurence 1999; Adams and Laurence 2001; Davies 2002).

A person's experience of the 'new' road network should be contemplated. To what extent would the provincial population come into contact with, experience or be influenced by the Roman roads? In rural areas it is possible that there was very little interaction with the network whilst in urban areas and settlements near Roman sites the influence would have been much greater. The influence would have been multi faceted as the roads influenced trade, economics and society (Addison 1980: 38;

[67] For information about the road numbering used throughout this thesis please refer to section 4.1.4.

Laurence 2001). The spread of the economic influence of the roads has been investigated using archaeological finds such as bricks, tiles and coal. These items which were heavy and awkward to transport give some indication of how extensive the trade and economic drive were, as if these bulky items, which have remained in the archaeological record, were transported routinely then other more easily moved items are also likely to have been traded and to have influenced day to day living (Darvill and McWhirr 1984: 240; Smith 1997: 297).

4.2 The Re-Use of the Roman Road Network

> *"Before proceeding further, it is perhaps not irrelevant briefly to review the question of the supposed continuance on a general scale of Roman (or pre-Roman) road systems, unchanged in alignment down to the present day…"* (Roe 1939: 194)

The Roman network was established, as we have seen, for military, economic and ideological purposes. Over time the ideological value of the road as a suppressive force diminished, the economic role increased whilst its military functions were maintained. Despite the changes in the ideologies of the roads over the four hundred year period of Roman rule the exit of the Roman administration took with it the military and economic rationale behind the system. The loss of the requirements for maintenance, along with the loss of engineering knowledge and the skilled and motivated work force of the Roman army would have led to a gradual, but steady, degradation of the network.

How the Roman road network survived into the Anglo-Saxon period in England was critical to the way in which it could be reused or altered for specific purposes in the period on which the thesis is focussed (1530-1730). It is therefore beneficial to examine the post-Roman transition, and the periods which followed. The Roman/Anglo-Saxon transition period was 'make or break' for the existing shape of the networks in County Durham. It is important at this point, therefore, to place the re-use of the Roman road networks from 1530-1730 within the context of their re-use during the Anglo-Saxon period.

4.2.1 Towards the Medieval Networks: Précis of the Anglo-Saxons and Beyond

The change over from 'Roman Britain' to 'Anglo-Saxon England' was not simple. The change was not a *"…uniquely catastrophic aspect of early fifth-century European history…"* resulting in a *"…Post-Roman cataclysm…"* (Dark 2000: 12). This period of change, from the fourth century to the sixth century, has attracted much attention and theories regarding the development from Roman to Anglo-Saxon during this period are much debated in the literature. The diverse theories can be roughly grouped as;

- The 'old establishment' belief in a 'phasing out' of Roman Britain during the fifth century (Frere 1967; Alcock 1973a)
- The 'continuitists' who look for overlapping Anglo-Saxon migration and a functioning Romano-British society.
- The 'new establishment' theory argues that there was discontinuity between Roman Britain and Anglo-Saxon England (Casey 1979; Bassett 1989; Esmonde-Cleary 1989).
- The 'short chronology' theory suggests that Roman urbanism was not successful in Britain and only a façade of Romano-British culture was in place, possibly being discarded before the Romans had left (Reece 1988; Rich 1992).
- A variation of the 'new establishment' view argues that whilst there was discontinuity some specific aspects of the Roman culture such as elements of administration were retained into the late fifth century (Higham 1992; 1995; 2007).

- A more generalised, popularist, approach is that the governing practices of Roman Britain dissipated fairly rapidly but the hybrid culture of Roman Britain and even the Romano-British language lived on well after the arrival of the Anglo-Saxons. Despite this hybridisation a key area of change brought by the Anglo-Saxons was one of economic separation from the continental Roman Empire. (Schama 2000: 45-6).
- Dark puts Britain, not at the periphery of Europe, but as being an integral part of it in terms of religious, economic, cultural and political development (Dark 2000: 15).

The contrasting theories of Britain being an integral part of Europe or of the economic and cultural focus shifting to the North Sea raise interesting questions about the continued use of Roman roads in England. The maintenance of a country with London and the south coast as the central area for trade and economic control would suggest a slower decline in the road network, which had been designed to facilitate connectivity with Europe. A shift to using the North Sea coast as the key communication route would have require the creation of an altered network (Dark 2000: 15; Muir 2000: 100). Most writers concede that, whatever the economic shifts or time frame over which the change from Roman Britain to Anglo-Saxon Britain took place, the network did fall into decline and that where continued usage along existing roads was preserved the maintenance was not. Even so, after over 600 years of neglect they were often still the easiest and most direct way to travel, the result of and testament to the ruthless manner in which their builders, the Romans, paid no heed to pre-existing rights of ownership, boundaries and agricultural practices (Morriss 2005: 112; Muir 2000: 100; Hindle 2001: 33).

The history of the Anglo-Saxons is one of evolving territorial units in which boundaries and networks of communication were intimately involved; from the expansion of the Anglo-Saxon settlements towards the formation of distinct kingdoms out of coalesced tribal units to the political competition and warfare as these kingdoms sought hegemony over their neighbours, eventually forming the kingdom of the Anglo-Saxons (Higham 1993). The Church provided a means by which aspirant kings could govern ever increasing territorial units and populations, because it provided, de facto, an administration for laws plus a network of representatives of authority on the ground (Holdsworth 1995: 46; Morriss 1997: 3).

Whilst the Roman concept of a defined, integrated and maintained road system vanished across the country, in County Durham the re-use of the Roman road system itself is long standing. Anglo-Saxon re-use has been plotted using finds of Anglo-Saxon sculpture and suggested '*mansio*'[68] sites linked to Lindisfarne. The sculptures are frequently found within five miles of Roman road 3 (Dere Street) and have also been found along Roman road 5 (Cades Road) (Cambridge 1989: 381-2).

The relics of St Cuthbert were transported extensively across the north of England; in the example of his relics being transported to and from Carlisle, which itself occupied a nodal position on the Roman road network, the presumption is that the body was carried along the remaining Roman road network (McCarthy 1999: 63). This hypothesis of the progress of St Cuthbert is also suggested by O'Sullivan and Young in their work on Lindisfarne (Beavitt *et al.* 1985; O'Sullivan and Young 1995).

The positioning of Anglo-Saxon monastic centres near to Roman roads is explored by Fleming who suggests that this choice of positioning was in part militaristic because the roads, and the well chosen Roman sites, provided strategic, defensible territories (Fleming 1985: 253-264). For the most part there seems little to support the argument that people stayed away from the Roman roads because they became dangerous for travellers. The system was there, it provided an efficient way of travelling long distances and being a strategic network its use was therefore retained.

[68] During the Roman period a '*mansio*' was an official stopping point or rest point along a Roman road, the equivalent to a coaching inn, or perhaps in today's terms a 'Travelodge'. In this context the word is used to describe a stopping point for religious dignitaries associated with Lindisfarne (Cambridge 1989: 380).

When the Normans arrived in England, they tried to, where possible, take advantage of, and utilise, some of the highly developed Anglo-Saxon legal, economic and fiscal institutions. It was in fact these advanced conditions of the Anglo-Saxon state that made England an attractive prospect to William. The Normans, in their turn, spread their own network of power relations, based on feudal military obligation, across England, where possible trying to replace existing Anglo-Saxon power centres on a take over rather than tabula rasa basis (McCord and Thompson 1998: 26-32; Jones 1993: 658).

Many of the Norman castles that were built in England and County Durham as part of this takeover of power are on nodal points of the Roman transport network. For example Bowes Castle, County Durham, stands in the north-west corner of the Roman fort of Lavatrae and the keep of this castle was built with materials from the original fort (Keys to the Past 2009a). In Durham it hypothesised that a pre-Conquest fortified structure existed on the site of the castle, fitting the pattern of Norman take over seen elsewhere. By the beginning of the twelfth century Durham had achieved an unusual combination of secular and religious power and the castle is, therefore, one of the principal castles in the north of England and served a dual function as a stronghold and an ecclesiastical palace (McCord and Thompson 1998: 32).

The shift in the foci of religious and regional power from the Anglo-Saxon period onwards led to a shift away from the primacy of the Roman route of Dere Street (Roman road 3) and towards the routes of the later Roman roads 4 and 5. The fact that the mobile Kings and Nobility of this period did not create and maintain a new road network, or maintain the old Roman road network, would imply that the remnants of the Roman system, plus the ad hoc additions to it, were sufficient to serve their needs, which as their rule was peripatetic and depended on the movement of the ruling elite from estate centre to estate centre and stronghold to stronghold would have been substantial (Moore-Colyer 2001: 55).

From the thirteenth century onwards, after the loss of the English Crown territory in France, England was divided into Crown estates governed by male royal scions, in part to maintain stability by diverting this potentially obstreperous and treacherous group by providing them with a 'raison d'etre' on English soil. In terms of bureaucracy the paperwork increases and the requirement of a viable and efficient transport network on which to convey the writs that travelled across the country between centres of Royal government such as Winchester and London, Shire centres, Crown estates, castles and towns is implicit (Smith 1983; Clanchy 2006). At the same time towns were becoming powerful centres of trade and production, with a correspondingly influential merchant class and craft elite. These developments entailed considerable development in the relations between towns, their hinterland and the network of smaller towns in the region. Throughout the Medieval and into the Post Medieval period more centralization takes place, but also, as a counter balance and corollary, provincial capitals such as Bristol, York and Newcastle became increasingly important (McIntosh 1986: 222).

During this long period of political, economic and social change large parts of the Roman road network persisted and remained in use, forming the basis of the national and regional communications system. The 1360 'Gough' map gives testament to this, as from the network of 3,000 miles of road that it illustrates forty percent have been shown to follow lines of known Roman roads (Moore-Colyer 2001: 56).

Roads also remained tools for the ideology of control. In 1357, a by-law from Horwood Manor, Buckinghamshire, specifies that only the four principal roads are to be used to exit the fields being worked. Later this is amended to only the King's way (Ault 1965: 19). In Hesleden, County Durham it was ordered that *"…none shall enter the fields except by the exits of the town…"* (Ault 1965: 18). This restriction and definition of the routes to be taken shows the power of control held by the land owners who used the roads to demonstrate and ideologically engrain their authority.

4.3 Re-Use of the Roman Road Network from 1530-1730

The main focus of this thesis is from the Dissolution of the monasteries until the onset of the turnpike system[69]. The Reformation and the Dissolution of the monasteries had implications for the topography of the towns that had developed during the preceding centuries, impacting on the communication networks both in the countryside and between the town and country.

The country's monasteries had formed a significant part in generating and controlling the wool trade, especially in the north. They also maintained bridges, crossing points and roads to serve their buildings and their trade (Hindle 2001: 49). John Leland, described as the first of modern English antiquaries and the first 'travel writer', became the first (and last), King's Antiquary; to Henry VIII in 1533. He travelled the country between 1539 and 1545 consulting and collecting ancient documents from monasteries and colleges throughout England. His various tours also included visiting parks, stately homes, cities, villages and towns throughout England (Leland 1539-45: 5). He often writes about bridges and river crossing points.

> "*The distance from Branspeth to Durham is about three miles, and rather more than half a mile before I approached Durham I crossed over a bridge with one large arch, as well as another, smaller bridge which spanned a pleasant river named Deerness…*" (Leland 1539-45: Chandler 1992:151)

He writes much less about the roads themselves, the implication being that they were more than adequate for horse back travel and therefore not worth mentioning (Hindle 2001: 49).

[69] In County Durham the first Turnpike Trust was established in 1740.

Whilst it is generally accepted that the quality of the roads became worse during the Post Medieval period[70] the effect that the Dissolution of the monasteries had on the associated infrastructure of bridges is more contested:

> *"The notion that the Reformation led to a reduction in charitable donations to bridges has been advanced intermittently in studies of bridges, and continues to be. It is an appealing theory because, if right, it might explain why so few new bridges were built at new sites in the period 1550-1750. It is however wrong."* (Harrison 2004: 214).

Harrison defends this assertion because, although the Doctrine of Purgatory as an inducement to fund bridges was abandoned, the Protestants put emphasis on charity which had practical benefits (Harrison 2004: 214). In 1559, under a directive from Elizabeth I, clergy were instructed to discourage parishioners from bequeathing money for any religious provision other than for the relief of the poor and to the highways (Duffy 1992: 568). It is suggested that instead of the Reformation causing the down turn in new bridge building, it was the Statute of Bridges 1531 that was the cause (Harrison 2004: 215). This statute gave the Justices of the Peace, with the assent of constables or 'the most honest inhabitants', the power to tax every inhabitant to repair those bridges where the responsibility for repair was unknown (Tanner 1930: 496-7) and therefore acted as a deterrent for the creation of any additional structures that may in time need maintenance (Harrison 2004: 215). It could also be argued that the system was adequate to the needs of the time and that there was therefore no requirement for the construction of additional bridges.

The full effects of the Dissolution of the monasteries did not become immediately apparent in and around London because monies bequeathed by Henry VII kept the key routes from Windsor to Richmond, Greenwich, Southwark and Canterbury in

[70] Not purely as a function of the Reformation

adequate repair during the reign of Henry VIII. In other areas of the country, however, lack of funding and the breakdown of the 'old order' of road maintenance by the monasteries and manors[71], resulted in a reasonably rapid decline of the routes once away from London and its environs (Addison 1980: 84).

From the second half of the seventeenth century an urban renaissance occurred where, once again, the provincial capitals became an important part of the country's economic and social life; in turn influencing the network needed to serve them.

In County Durham the new, or newly empowered, local industries created their own networks to serve their own needs, whilst the remnants of the re-shaped and re-used Roman network became the backbone for the burgeoning carrier services, the post and were, once more, called into military use.

4.3.1 Purpose, Rationale and Usage

The purpose and rationale behind the reuse of the Roman road network can be seen as functionally and economically motivated. The Roman network through the militaristic nature of its creation by a conquering force created a network that was broad scale, linking north to south and east to west across the entire country. Its re-usage for post, carriers and the military was also, therefore, broad scale in nature as these activities took advantage of the pre-existing, extensive rights of way, rather than having to bear the cost, time, logistic and legal difficulties of creating their own new networks.

4.3.2 Post

Postal systems have been in existence for over 4,000 years and they represent a communications network that is both co-ordinated and stable (John 2001: 11834). The Roman road network was both co-ordinated and stable and Ramsey sets forward

[71] Which had been happening for some time even before the Dissolution of the Monasteries

the proposition that *"…a postal service appears only the natural completion of the road-system … and the roads were much less useful without it. It is…virtually implied in the conception of a road-system planned, to carry not merely troops but also regular administrative service…"* (Ramsay 1920: 80). The importance of an administrative impetus in the creation of the routes is indeed bound to the military requirements for maintaining control and disseminating military information and orders.

A Royal courier service, usually driven by military imperatives, was maintained after the departure of the Romans. One example of a Royal post service being in 1482, when a strategic system was required to send and receive information about the War between England and Scotland (Kay 1951: 1). This was a co-ordinated relay system based on horsemen at 20 mile intervals, thus allowing for considerable speed of delivery, a letter could be carried 200 miles in 2 days (*ibid*: 1-2).

It is interesting to note that there is some evidence that the Roman postal system was based not on a relay system but on the delivery of the dispatch by the person to whom it had originally been given, so that they could, if needed, give additional verbal information and clarification. This seems to have taken precedence over speed (Ramsay 1925: 61-2). Different postal services providing delivery at different speeds were available, to different sectors and for different costs. Foot posts were believed to be the fastest method. These were men who, running on foot over long distances, could maintain a faster average speed than a horse, the speed of which rapidly decreases over distance. Relay posts with horses at regular intervals were the next quickest. Lastly was the option of sending letters with a carrier. This method took much longer as not only did it take longer to cover the distance but time allowances for reloading, changes of horses and overnight stops also had to be taken into consideration (Crofts 1967: 51-2; Nixon 1616).

The speed of the relay post across County Durham in the 1600s was slow, often averaging 1 mile per hour, compared to 3 to 4 miles per hour further south and around London (Beale 1998: 180). The causes of the regional differences in speed were maintenance and funding. The King's Highway around London had always been maintained and funded[72], whereas routes further away had only been able to rely on private monies and maintenance and subsequently the 1555 Highways Act for their upkeep.

By the sixteenth century the physical remains of the Roman network were in great disrepair but the network as a concept for allowing movement through the country was still present and stable (Kay 1951: 9). Tudor postal routes were well developed and permanent and subsidised routes were established[73]. The London to Berwick route was the first to be trialled as a permanent route, it followed the route that was to become the main post road (described below) with the exception that it by-passed York which was included on the later routes (Beale 1998: 167).

By the eighteenth century the post, which was only for letters, could be seen to be divided into four types: the through post[74]; country letters; bye-letters and the cross-post (Bird 1973: 113). The through posts were letters sent to London which went along the major routes, country letters went into London and were then forwarded to the final destination, bye-letters were collected and delivered at designated points along a through route and the cross-post linked provincial towns, without the requirement of the post having to go via London (*ibid*: 113).

Through routes were those which allowed people to 'ride through', they were the major, arterial route for a county (Crofts 1967: 78). In England there were four

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[72] For example monies bequeathed by Henry VII kept the key routes from Windsor to Richmond, Greenwich, Southwark and Canterbury in adequate repair during the reign of Henry VIII (Addison 1980: 84).
[73] Although this funding was not always maintained.
[74] Also referred to as through mails or London letters (Bird 1973: 113).

through routes connecting London to Berwick, to Holyhead, to Exeter and to Dover and from these points Scotland, Ireland and the Continent could also be accessed. These routes mainly, where extant, followed the old Roman network. For example, Watling Street formed part of the London to Holyhead route (Allen 1972: 53-5).

Roads in County Durham formed part of the 360 mile long London to Berwick route. This started on the course of the Roman road leaving London and heading to the first post at Waltham. The second post was at Ware, on the Roman road of Ermine Street the route continued along Ermine Street to the next posts of Royston, Huntingdon and Stilton. The next section through Cambridgeshire and Lincolnshire passed the site of a Roman camp and stopped at Stamford, Grantham and Newark, where two major Roman roads, the Fosse Way and Ermine Street, converge. After Tuxford, Doncaster, Wentbridge and Tadcaster the route continued along the Roman road to York. From York the next posts were Topcliff, Northallerton and then Darlington before Durham, after which the Roman road was taken to Newcastle. After Newcastle there were posts at Morpeth, Alnwick and Belford before the final stop at Berwick (Allen 1972: 53-5; Kay 1951: 23; Hill 1702).

In County Durham there were, by the 1720s, four cross-post routes linking Durham to Sunderland, Carlisle (via two routes) and Stockton. Of these only the route to Sunderland did not incorporate elements of the Roman road network. As the route to Stockton followed Roman road 5, the southern route to Carlisle followed the Roman network using Roman road 1 and 2 and the northern route to Carlisle used the network next to Hadrian's Wall (Oxley 1980; Kay 1951: 40).

Without an effective postal system effective administration, government and military manoeuvres would have been impossible. Although different systems developed and changed over time to suit the needs and requirements of the letter writer, be they Royalty, merchants or private individual, these different systems all provided an extensive and effective communications network based, in part, on the Roman road system.

4.3.3 Carriers and Coaches

Carriers' services were relatively slow, had an established clientele and predominantly carried goods. Coach services were quicker, less established and chiefly transported people. The reason that the carriers were so well established was because they had been around for a substantially longer period of time. The first record of a carrier is from 1398 whilst coaching was still a new industry in the 1680s. Carriers and coach services were similar in some respects. They used the same roads, relied on the use of horses and their trade depended on reliability and speed (Gerhold 2005: xvi, 3, 79).

The advantages of road over water are still underestimated, with the assumption that waterways were of supreme importance during the Post Medieval period and yet roads provided a fast and reliable service without the risk of a lengthy delay caused by the weather or obstructions associated with sea and river transport (Chartres 1977a: 39; Gerhold 1993a: 1). During the period from 1500 to 1700 Chartres estimates that the road transport carrying industries may have experienced a three or four hundred percent increase in their trade and transport capacity, demonstrating the fundamental importance of road systems to the continuing economic development of the country (Chartres 1977a: 41)

Carrying was a male dominated profession, but women working as carriers were not unknown. They were almost all widows of carriers and may have been retaining the family business until such time as a son could take it on (Gerhold 2005: 25). Carrying took place using either wheeled vehicles drawn by horses or by packhorses. The word 'waggon'[75] appeared for the first time in the English language in the

[75] Also written as wagon and found in early modern texts as wagen, waghen and wagan (OED 2010).

sixteenth century, from the Dutch wagen, indicating that a four wheeled vehicle had been introduced from Holland, the new word ‘waggon’ being used to differentiate this new technology from the English ‘wain’, which was used to describe a two wheeled vehicle (OED 2010; Parkes 1925: 7). The sixteenth and seventeenth centuries saw the steady replacement of carts by waggons in the carrying trade. They did not however, supplant the packhorse and in the late 1600s the number of waggon services and packhorse services were not too disparate (Gerhold 1996a: 141). Figures from 1681 show that the total services from London total 166 per week for packhorses and 198 per week for waggons (Gerhold 2005: 4-5).

The goods that the waggons and packhorses transported were varied and can be split into six categories, manufactured goods, raw materials, food, shop goods, gentlemen’s goods and miscellany. Overall the cost of road carriage was higher than transport by water and so these goods were usually of higher value in relation to their weight than items sent by water (Gerhold 2005: 34-8).

The most prominent of the transported items were manufactured goods such as textiles, leather work and metal work. In the 1680s a carrier from Wells defined their work as being for the carrying of broadcloths (Gerhold 2005: 35). This fits well with the picture of economic change seen in the late and Post Medieval period in England where there was a significant shift from the export of wool to the export of finished, manufactured goods such as broadcloth[76]. From 1350 to 1450 the figures for English wool exports fell by over 75 percent, from around 40,000 sacks per year to only 9,000[77]. Against this dramatic fall there was a marked increase in woollen cloth export. In the same period the export figures for broadcloths leapt by six hundred percent from c. 10,000 to 60,000 broadcloths per year, attaining levels of around

[76] Broadcloth is plain-woven, fine and dressed cloth of double width. It is often black in colour and used mainly, although not exclusively, for men's clothing. The term is now used to confer an image of quality rather than width (OED 2010).
[77] The export figures remained at this level until around 1500 (Pollard 2000: 180).

70,000 by 1500 all of which would have required transport either by water or by carrier (Pollard 2000: 180).

Raw materials such as leather, wool, sheep skins and steel were also transported to and from London[78]. Food items were varied and were usually fresh or of a high value. Produce included fish, cheese, vegetables, cooked meats, raw meats and honey and could also include alcoholic drinks such as cider. Shop goods could be anything from medicinal tablets to hats, with tobacco, books and ribbon in between. 'Gentlemen's' goods were those items such as furniture and paintings being sent between London and country homes. The last category, 'miscellany' could include exotic spices and silks or be an animal such as a horse or a dog (Gerhold 2005: 36-8).

Although the internal carrier network was extensive, Durham's inclusion in a route from London was late, there being no service in 1681 increasing to two per week by 1715. One reason that the carrier services may have taken time to become established may have been the importance of regional trade in County Durham with Newcastle and York. The increase in carrier traffic during the late seventeenth and early eighteenth centuries suggesting an increase in London centric trade and a sign of London's increasing commercial growth, prestige and power (Chartres 1977b: 77, 81).

From 1680 onwards Stage-Coaches direct from London went as far as York, from where there was a weekly service to Newcastle and a fortnightly service to Edinburgh (Gerhold 2005: 79). These services took the same route as the through post, re-using parts of the Roman network, although there were additional stops along the route.

The roads from 1530 to 1730, although in poor repair in comparison to the highly engineered surfaces created by the Romans, were adequate to provide a substantial, extensive carrying network which grew to cover the whole of England and so the idea

[78] The usual pattern being into London for processing and out of London for sale.

that the roads were treacherous and impenetrable would appear, prima facie, to be incorrect (Chartres 1977b: 82). Although the routes were passable they were, in many places, far from ideal and the Civil War did little to improve either trade for the carriers or the conditions of the roads.

4.3.4 Military Re-Use: Civil War 1639-51

The Civil War was for the transport network of England an *"…unmitigated evil…"* (Parkes 1925: 24). By 1651 the high volume of traffic, both wheeled, on hoof and on foot, that had made use of the roads left them quite literally worn through. The war had also prevented the appointment of surveyors and so even the small amount of work usually carried out on the highway, under the 1555 Highways Act, had been abandoned during the period of the conflict, resulting in the complete degradation of road network (*ibid*: 24).

Whilst the overall volume of traffic increased during this period, the diversity of uses decreased. The War brought severe problems for the post system as administrative chaos, conscription and ambiguities as to who held power in different areas left the system unable to function. There was also a decrease in travel for pleasure (Ellis 1958: 8).

The context of the Civil War within this thesis is confined to the north east and to those aspects with a bearing on the road system of the region and County Durham. Texts providing a broader overview of the Civil War include: Hexter 1978; Groenveld 1987; Bennett 1995; Hughes 1998; Bennett 2000; Orr 2002; Adamson 2008.

The Solemn League and Covenant between the Scots and Parliament was signed in 1643 and is often seen as a turning point of the Civil War. In the north east most of the gentry families were royalists and the Earl of Newcastle's royalist forces had dominated the military arena and so the co-opting of the Scots created a substantial threat to the region, as the Scottish government had promised to provide an army of 19,000 on foot and 2,000 on horse (Stoyle 2005: 73).

Newcastle was a key military site, it received Royalist supplies and weaponry from the Continent and also controlled the coal supplies to London (McCord and Thompson 1998: 149) and so it was to Newcastle that the Scottish troops headed in early 1644. With the defences of the city in less than ideal repair and many Royalist troops having been dispatched to fight Parliamentarians in Yorkshire, the capture of Newcastle may have been thought to be a formality. There were, however, two key reasons why the Scots failed to take Newcastle, each of which was linked to the roads through the region. The Scots, heading south were faced with flooded roads caused by an unexpected thaw and with bridging points destroyed by the retreating Royalists, the Scots managing to cross the Derwent at Ebchester on Dere Street. The Royalists heading north from York, recalled for the defence of Newcastle were able to travel swiftly along a long established route. The result being that the Royalists arrived at Newcastle in time, a few hours before the Scots, to strengthen the defences and reject the subsequent summons for surrender (Plant 2006; Stoyle 2005: 82). The Scots subsequently camped at Harraton, near Chester-le-Street, on Cades Road before continuing on to Sunderland where the towns men ‘declared for Parliament’ and were able to set up a fortified garrison in the north east (Plant 2006).

During the Civil War the north east was faced with a dichotomy, Parliament was a potent symbol of English nationhood and yet they were ‘in league’ with the traditional enemy, the Scots. In 1637 Northumberland and Durham had been occupied for a year by the Scottish after the “Bishops’ Wars”. This had created great rancour and bitterness towards the Scots and the prospect of being defeated by the Scottish again galvanised many men into volunteering for the Royalist cause (Stoyle 2000: 1116; Stoyle 2005: 74, 83).

Conscription, especially for the infantry was used much more by Parliament. Conscription for the Royalist infantry did not start until 1644 and was largely unsuccessful and so they relied on those who actively wanted to fight, as seen in County Durham, which often produced a more coherent and motivated army (Gentles 1993: 408).

Despite withstanding the initial 'Scottish' attack and recruiting more men to the Royalist cause, Newcastle finally fell after a second siege which lasted for three months. After the capture the Scottish army stayed and occupied the city for three years, until 1647, creating yet more animosity between the north east and Scotland (Bennett 2000: 27-9).

4.3.5 Creation and Development

The notion that the Roman networks continued to be used throughout the country, unchanged, over many centuries would fail to take into account the changing impetuses, needs and requirements of the road network over this extended period of time. Changing settlement patterns necessitated new access roads and changes in the importance of towns and economic requirement also influenced the evolving network.

Many of the Post Medieval road networks were legally established in the Medieval period, in pattern that broadly speaking can be seen to re-use Roman roads[79] as has been shown in County Durham. These networks in turn created habitual routes, fed navigable river systems and served expanding trade and industries which grew considerably towards the end of the fifteenth century (Hindle 2001: 41). The increase in trade and profit was directly linked to the types of goods being exported to Europe. At the start of the fourteenth century England had been a key exporter of raw materials such as wool, but by the end of the fifteenth century the exports had changed to finished and semi-finished goods, principally woollen cloth as discussed

[79] Watling Street, the Fosse Way, Ermine Street and Icknield Way were deemed to be under the King's protection (Hindle 1998a: 6).

in section 4.3.3. This change in exports increased profit for the traders and also provided increased employment diversity for England's working population (Pollard 2000: 180).

There were changes too in the focal point of trade within the country as well as the goods it traded throughout the fifteenth century and by 1500 London had become the main hub of England's economy leaving many other towns, which had had a strong trade heritage, on the periphery. In the north, for example, the manufacturing district of West Riding of Yorkshire, supplied London rather than York or Hull, as London could offer 'superior credit terms' (Pollard 2000: 180-1). The area that supplied London reached from Scotland to the south coast of England. This shift in, and centralisation of, power created an England controlled by one city, London, with previously autonomous commercial centres becoming subordinate to it (Braudel 2002: 40-1). Pollard suggests that the trade routes shifted and altered to fit this new pattern with previous centres of trade and trade routes forming part of a larger more standardised national network (Pollard 2000: 181).

The Roman roads, forged as penetration roads and territory holding roads and so far-reaching in their very existence, formed an overall, long distance network, onto which new roads and routes were added. This pattern of re-use is clearly seen in County Durham. Work by R. Neville Hadcock shows the overall resultant network shape to be one predominantly re-using the Roman network with a further sub-network comprising roads and tracks that connected market locations and religious houses (Hadcock 1939: 218). One striking change in County Durham which supports Pollard's hypothesis is that although the Roman roads continued to be used there was a shift in the levels of importance of the routes away from Dere Street to one where Cades Road provided the main thoroughfare from Durham to the north. The Gough Map (c. 1350) shows that Dere Street was in use to the point of Scotch Corner and that the route through Brough and Bowes was also still in use (Lilley 2009). The Ogilby Map from 1675 indicates that the main route into County Durham enters via

Darlington, positioned mid way between the two original Roman routes. The focus of the road was Durham after which the alignment of Cades Road heading to Chester-le-Street is followed (Ogilby and Engraved by Eman Bowen 1675/1724; Hill 1702). This matches immense changes within existing industries and the creation of new ones in County Durham during the Post Medieval period (Pollard 2000; Braudel 2002).

In addition to the change in trade patterns these shifts are most likely to have been the result of and facilitated by the very concept of a 'road' in the Medieval and early Post Medieval period. The roads as structures themselves were not seen as a right, only a route, somewhere that crops were not planted and manure was not stacked, and it was only the route rather than the structure of the road that was protected. An account of an incident involving a Leighton Buzzard glove maker provides a measure of the attitude of the general population of the time to roads (Coulton 1939: 323-4). The glover, returning from Aylesbury market in late 1499, died when he fell into a pit in the middle of the road and drowned. The pit had been dug by the servants of a miller who needed the clay to repair his mill. This hole, eight feet by ten feet and nearly eight feet deep had then filled with rain and become invisible in the evening light. The miller was charged for causing the death of the glover but acquitted because there was no malicious intent to kill; he simply claimed that he did not know where else to get the clay he wanted. There was also some dislike of travellers who had the right[80] to disrupt farm land when the roads became impassable. Wheeled traffic was even worse, causing much more damage and being more likely to have to diverge from the usual route (Addison 1980: 85; Crofts 1967: 14).

The resultant roads therefore conceptually differed substantially from the extensive network of constructed and metalled Roman roads. Rather than being rigidly and spatially defined they were 'rights of way', but importantly, often with both customary and legal status. If traversed frequently the routes became distinct, both

[80] The Statute of Winchester 1285

legally and physically, although a strictly defined road was not necessarily the outcome. Deviation from the common route was allowed if there were obstructions or bad weather made it unusable. This right was protected by law in the Statute of Winchester of 1285 (Hindle 1998a: 6). These travellers' rights are visible in the most frequently preserved form of Medieval track which is often made up of multiple tracks up hillsides because travellers were allowed to form more than one routeway up hills and banks which, unlike many other routes, have not been incorporated into subsequently cultivated land (Hindle 2001: 41).

The Post Medieval period saw, in stages, these routes return to a constructed and maintained network as the maintenance systems were driven to change through the Dissolution of the monasteries and as the usage of the roads became part of systematic postal, carrier and coach routes, ultimately culminating in the creation of the Turnpike Trusts.

4.3.6 Physical Characteristics and Maintenance

"…the final dissolution of the monasteries took away almost the last few friends of the highway…" (Parkes 1925: 6)

With the Dissolution of the monasteries the 'old order' of maintenance, based on religious funding and imperatives crumbled. In the north the Dissolution of the monasteries led to the reward of royal officials and influential local laymen, resulting in a substantial weakening of the Church's power, which had been used to maintain an adequate network of roads to serve the Church's, and consequently the area's, needs (McCord and Thompson 1998:108-9; Tanner 1930: 495).

Within a generation of the Dissolution of the monasteries, 1555 saw the creation of an Act of Parliament that sought to solve many of the problems of the roads, many of which were now impassable in winter. The condition was described in the act as

"…now both very noisome and tedious to travel in and dangerous to all passengers and carriages…" (First Statute of Highways 1555: Tanner 1930: 498) and so under the 1555 Act[81]:

> *"…every person holding land of an annual value of £50 or more, either arable or pasture, was required to supply two able bodied men, with a team of oxen or horses and tools or implements for the work of repairing the highways for eight hours on four consecutive days annually."*[82] (Addison 1980: 87)

In addition to this, surveyors and parish overseers, were entitled to take and dig gravel for free and cottagers without land had to give work days, either doing the work themselves or finding substitutes (Addison 1980: 87 and Tanner 1930: 498-9).

In some areas, particularly remote ones, this arrangement worked well, the system being used well into the nineteenth century but in other areas flaws in the Act meant that no improvement was seen. The main limitation was that the legislation did not specify the technique that should be used for road construction or repair, or which routes should have priority (Crofts 1967: 14). William Harrison, writing in the 1570s tells of these problems and of the fact that no incentive was given, not even to the appointed surveyors, to inspire work to be done:

> *"The rich so do cancel their portions and the poor so loiter in their labours that of all the six scarcely two good days' work are performed … and some of the work that was done was not upon those ways that lead from market to market, but each Surveyor ammendeth such byplots and lanes as seem best for his own*

[81]The Highways Act 1555 also referred to as the First Statute of Highways
[82] In 1563 this was increased to six days.

commodity and more easy passage unto his fields and pastures."
(Harrison 1586; Holinshed *et al.* 1587).

Whilst the Romans had used different materials and local resources in the building of the network they had an underlying understanding of the engineering and construction techniques and requirements needed to build a serviceable road. Without guidance the maintenance work carried out by the parishioners as a result of the 1555 Act was, however, not based on engineering criteria but on an ad hoc availability basis of materials and skills to hand. The choice of which routes were to be maintained led to the surveyors making sure that the access to their homes was in good repair before attending to the requirements of the community as a whole (Crofts 1967: 14).

The division of the work into parishes resulted in an uneven burden of responsibility, some parishes having only minor local roads to maintain and others having to maintain major carrier routes, both, perhaps, equipped with the same resources and skills (or lack thereof) (Hindle 2001: 50). Despite its failings it was not until the General Highways Act of 1835 that the 1555 Act was finally repealed, long after the turnpike system had taken control of the country's main transport network (Hindle 2001: 50, 91; Albert 1972: 14).

A swathe of legislation and amendments followed the 1555 Act, to try to both repair damage and to prevent further damage from occurring. Weight restrictions on coaches and waggons were introduced in 1621 under James I. This limited weight to 1 ton but had little impact on the network as it was rarely enforced. 1662 brought an Act which tried to prevent the damage caused by the wheels of the vehicle, especially in the poor winter weather, by stipulating that they should be a minimum of four inches wide and that the number of horses should be no more than seven. Additional legislation pertaining to horses, their number, the number of animals in a line, the positioning of horses in relation the waggon tracks followed. The minimum widths for roads and the distinction between ‘drift ways’ for horse and foot traffic and ‘cartways’ were laid down in law in 1691 (Hindle 2001: 50; Davies 2006: 176-7).

In conjunction with the legislation to restrict certain carriages, coaches and numbers of horses, ever more novel ways of preventing carriages from overturning, to improve manoeuvrability and to create safer vehicles were suggested and pioneered. None of these, or the restrictive measures had any real effect as the underlying causes of the issues which were the poorly engineered and maintained contemporary roads.

The repairs in most parishes consisted of little more than clearing ditches and applying gravel, the highly engineered Roman road with firm foundations, a hardwearing top course and a camber to prevent water logging and flooding having disappeared long before. The dearth of engineering solutions was not resolved until a new funding mechanism, the turnpikes, created a system of maintenance which was not based upon unskilled statute labour (Parkes 1925: 24; Hindle 2001: 50).

The issue of the condition of the road network and the extent to which the roads were close to being impassable for all but the hardiest traveller in the winter is one that raises debate. It is generally accepted that the roads declined in condition after the Dissolution of the monasteries; in part through the change in the maintenance system and in part through an increase in wheeled traffic.

The effect of poor weather, especially in the winter, would also have played a role in the degradation of the system, which would have been compounded by the increase in wheeled traffic. During this period, already bringing many changes to the physical characteristics and maintenance of the roads, there was a change in the typical climate often referred to as the “Little Ice Age”[83]. This term is used to refer to a period between 1300 and 1850 although there is continued debate as to these start and end

[83] A term coined in 1939 by F. Matthes a glacial geologist (Fagen 2000: 47-8).

dates. By the early sixteenth century England was dealing with the direct influence of this change in its climate. The weather during this period increased in variability.

Whilst there was a general decrease in the average temperatures some years saw extremely hot summers, some substantial increases in precipitation and yet others had winters of intense cold. Winter fairs were held on frozen rivers[84], vineyards were established and heavy rainfall caused crops to fail. The inconsistency of the weather and the rapid nature of the climate changes sometimes shifting over decades, whilst at other time changing yearly, brought with it many challenges and changes (Lamb 1995: 230-1; Fagen 2000: 49).

The effect of this variable weather on the roads and routeways is thought to have been substantial during periods of increased rain as the unmetalled road system had no surface to repel water, no camber for water run off and no drainage system to take water away. It has been postulated that periods of snow and ice may have made routes impassable or very dangerous whilst hot summers brought the alternative problems of dust and broken road surfaces.

It seems clear that 'winter' was a time when travel was more difficult as legislation from the period often distinguishes between the allowances for summer and winter. For example in the 1662 Act the weight of a waggon was limited to 1.5 tons in summer but restricted to 1 ton in winter. Whilst some sections may have become unusable in winter the impassability of a road would have been localised, traffic and weather dependant.

The notion that all travel ceased in winter is not one that is supported by evidence. Hindle contests the view that the road network as a whole became treacherous, using documentary evidence which shows that royal itineraries continued, as did heavy haulage. Stage coach and carrier services continued throughout the winter months,

[84] For example the frozen fairs on the Thames in 1676 and 1684 (Lamb 1995: 231).

although the journey times were longer. In addition the post continued with allowances for winter travel in the required times. Records from the 1580s show that post from London to Berwick should have taken 42 hours in summer and 60 hours in the winter. It is also possible that alternative routes were used and that the mode of transport was adapted for the season, for example riding horses rather than using carriages (Hindle 1996: 170-171; Gerhold 2005: 90; Beale 1998: 180).

4.3.7 Towards the Turnpikes

The next fundamental change in the funding, construction and maintenance patterns of roads and routeways did not occur until the advent of the turnpike roads, which charged users, at the beginning of the eighteenth century. The first application for a Turnpike Bill had been turned down in 1621, on the grounds that it was an intolerable additional tax (Davies 2006: 176) and so it was not until 1663[85] that the rights for the first turnpike road, whereby travellers paid tolls to use the road that were in turn to be used for road upkeep in return for an improved road for their journey, were granted. The exceptional grounds for the granting of this act were the fundamental issues imbedded in the 1555 Act itself that, meant that parishes with the Great North Road running through them had an undue burden of maintenance, after all if the Great North Road had localised impassability, then this would have impacted the entire long distance network (Bogart 2005b: 480).

Additional Turnpike Acts followed slowly, however the first Turnpike Trust[86] was not established by Parliament until a Turnpike Act in 1706 enabled this to take place. This placed a section of the London to Coventry to Chester road in the hands of a group of independent trustees rather than local justices. The trustees could erect toll point gates in order to demand statute labour or the monetary equivalent. They could also appoint surveyors and collectors. In return they repaired the road, eased

[85] For a section of the Great North Road in Hertfordshire.
[86] To oversee the maintenance and funds.

gradients, improved alignments and from 1744 most turnpike roads were required to be equipped with mile stones[87] (Albert 1972: 15-16).

Initially the Turnpike Trusts were established for limited periods of approximately twenty years. The expectation being that the trust would borrow the money to repair the road and repay that debt over time with the road then reverting to the local authorities[88](Albert 1972: 14-16). The granting of the rights to create the first turnpikes in County Durham did not occur until 1747, when Acts were granted for the routes Catterick Bridge to Durham, Durham to Sunderland, Durham to Tyne Bridge and Stockton to Barnard Castle (Rosevear 2009). Work by Bogart 2007 investigates the spread of the creation of turnpike trusts throughout the county.

Whilst the Turnpike Trusts increased the amount of money invested into the road network and improved the roads, the carrier and coach businesses were undergoing immense changes. A 40% reduction in freight charges is recorded as is a 60% decrease in passenger travel times. This duality in the timing of these changes coinciding with the advent of the turnpikes is the key discussion point in many works on the turnpikes. It is argued by some that the road improvements were fundamental to these changes whilst others are of the opinion that other occurrences, such as the breeding of horses, were pivotal. These issues are discussed further in Albert 1972; Freeman 1979; 1980; Linsley 1992; Gerhold 1996b; Bogart 2005c; 2005a; 2005b.

The creation of the turnpikes and the work by Telford and MacAdam on road engineering and surfacing saw a return to the ideology of the road as a symbol of progress, forging forward and showing engineering prowess just as had been the case with the original Roman roads, now often subsumed into the turnpike system (Morriss 2005: 119-120). Economic motivations, as well as the increasing travel for

[87] This became compulsory for all turnpikes from 1766.
[88] The debt however was rarely cleared and the Trusts were often renewed.

pleasure, were also served by this new turnpike system that had been created to maintain the, in parts old, network.

Laugero (1995) analyses the ideology of the turnpike roads by studying them as 'Infrastructures of Enlightenment'. The turnpike network both fragmented and unified the country just as the Roman network had done, dividing the known landscape and also unifying it by providing access. He postulates that the turnpikes brought about *"new kinds of individuals for a new kind of society"* through the circulation of people, goods, ideas and information (Laugero 1995: 45), again echoing the effects brought about by the original Roman network.

The Turnpike Trust system, however, eventually came to an end with the last Turnpike Act being passed in 1836. By 1850 the use of roads for long distance travel was in decline as the age of the railways began to change the face of the English transportation with a system that saw the laying out of a systematic (albeit created piecemeal) and eventually integrated broadscale transport network that had not been seen since the Romans first built their roads (Anonymous 1841; 1868; Roberts 1956).

4.4 GIS and Graphical Analysis

4.4.1 Aims of the GIS Analysis

The fact that the Roman routes which were retained as parts of later transport networks would suggest that they exemplify a successful and enduring road type. To enable the comparison of slope and distance with the other route types, for example their possible similarities to turnpikes and waggon ways and the distinction between this network and lead routes, the slope of the routes has been plotted and analysed. This then allowed an investigation into distance as an imperative in order to determine possible key motivators in the placement of the routes (section 4.7). The methodology allows you to establish factors which the thesis argues are crucial factors to the longevity of the system, as well as providing templates for later routeway types.

4.4.2 Issues Pertinent to the Roman Roads

One of the fundamental issues with the Roman roads is that of scale. The Roman roads were a long distance network which crossed through what has since become County Durham. The result of this is that the start and finish points used in the GIS analysis for Roman roads 1, 3 and 5 are arbitrary demarcations of where the roads enter and exit the county. For Roman road 2 its limits are the county boundary and its junction with Roman road 1. Roman road 4 is a route contained entirely within County Durham, linking 3 and 5, thus its junctions with these routes provide its start and end points. It must be appreciated therefore that even these start and end points within the county are arbitrary as a journey through the study area could have comprised any combination of the roads.

As discussed in chapter 3 (sections 3.2.2 and 3.3.4) a combination of map, archive, archaeological and HER data was used to plot the roads. The potential limitations of this must, however, be noted and the effects considered as a change in the plotting of a road could mean that it would cross a different cell in the GIS. The cell resolution of 50m by 50m was chosen to try to minimise this with reference to the fact that the OS mapping of the Roman roads was seen in the field to be +/- 12m away from the mapped road.

4.5 Plots Derived from Slope and Elevation Data for Roman Roads 1 to 5

The commentaries in sections 4.5.2 to 4.5.6 and 4.6.1 to 4.6.5 comprise only noteworthy items. An overview, therefore, is provided on how to read the graphs hereunder and is followed by salient points and interesting patterns discussed by road. The graphs for the Roman roads 1 to 5 are figures 13 to 28 inclusive and are located in section 12.3.1 of volume 2.

4.5.1 How to Read the Graphs

Elevation against Distance

With a view to create information that relates to the journey that would have been experienced and to highlight the fact that this is different to the distance that would be assumed if just using a map, both the traversed distance and the horizontal distance are plotted on the 'elevation against distance' graphs. The traversed distance represents the actual distance that would have been travelled, taking into account the fact that 'crossing' a 3-dimensional mapped landscape creates a distance that is different to that of 'crossing' a 2-dimensional representation.

The x axis is distance in metres, with the axis set at a maximum of 45,000m for ease of comparison between all of the roads[89]. The y axis is the elevation in meters, with the axis set to a maximum elevation of 700m.

For the least cost routes the x axis is set to a maximum of 90,000m the y axis to the maximum elevation of 700m. Again for ease of comparison between all of the least cost routes this is the same for all road and route types.

Slope in Degrees Against Point Number

These graphs plot the slope values at 50m intervals along the routes. The x axis maximum point number is set at 900. The y axis has the slope values every graph set from -25 to +35 degrees. These are positive if representing an incline and negative if representing a decline. The least cost routes have a maximum on the x axis of 1,800 and a range of -15 to +15 on the y axis. These are set for again for ease of comparison and for all road and route types.

[89] This includes the drove routes in chapter 5 and lead routes in chapter 6.

Histogram for Change in Elevation (m) Between Points a 50m Intervals

The histograms show the change in elevation between the points. For the Roman roads the histograms would be expected to show the bins between -2 and 2 to have the highest frequencies.

As discussed in chapter 3 the Roman roads were isotropic[90] and so, for example the histogram for Roman road 4 has also been plotted to show the absolute values which represent the fact that the route was used in both directions.

It must be noted that the graphs indicate the change in slope between the cells and not the slope of the cells themselves.

4.5.2 Roman Road 1

Roman road 1, as depicted in the graph, runs west to east from Brough to Bowes and on to Shildon.

Elevation Against Distance (figure 13)

The route of this road is along a similar route to that of the A66, coming across high ground in the south of County Durham and then heading north east where it joins Roman road 3 at Bowes, the site of the Roman fort Lavatris. This change in elevation is clearly evident in the graph because the initial elevation is above 435m; this has fallen to 210m by the end of the route in this direction.

Slope in Degrees Against Point Number (50m intervals) (figure 14)

The values for the slope are predominantly between -5 and +5 degrees, indicating a fairly even road even though it is changing elevation; the gradient is for the most part smooth. One section of increased slope occurs between points 300 and 400 where the slope, at an average of 10 degrees, is more pronounced.

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[90] See chapter 3 sections 3.1.2 and 3.2.4.

Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 15)

The histogram shows that the change of elevation between points on the route is, as expected, low. In one section however the change in elevation is 10 m, which over a distance of 50m is substantial (1 in 5).

4.5.3 Roman Road 2

Roman road 2, as depicted in the graph, runs west to east from Bowes to Scotch Corner.

Elevation Against Distance (figure 16)

Roman road 2 branches from Roman road 1 at Bowes and heads in an easterly direction to Greta Bridge then goes south east out of County Durham. This graph shows a moderate gradient with no sudden changes in elevation.

Slope in Degrees Against Point Number (50m intervals) (figure 17)

The slope for this route is closely grouped in the -3 to +3 degrees showing a moderate slope. It peaks at 5 degrees, which is the same as the majority of the spread for route 1.

4.5.4 Roman Road 3

Roman road 3, as depicted in the graph runs north to south from Ebchester, via Lanchester down to Binchester, Shildon, Piercebridge and Scotch Corner.

Elevation Against Distance (figure 19)

Roman road 3 incorporates what is known as Dere Street, a section of which was excavated as part of the research for this thesis. It cuts north-south through County Durham, with route 1 joining it west of Shildon. This road has a varied profile reflecting the varied topography of a cross section of the county. Its maximum elevation is 256m and its lowest is 90m, this change in elevations is, unlike Roman roads 1, 2 and 4, not predominantly in one direction. The route of Roman road 3 is varied and increases and decreases in elevation at irregular intervals.

4.5.5 Roman Road 4

Roman road 4, as depicted in the graph, runs south west to north east from Willington to Durham.

<u>Elevation Against Distance (figure 22)</u>

This road links Roman roads 3 and 5 cutting across the county in a north easterly direction. The overall trend for Roman road 4 on this heading, is that of descent, starting at an elevation of 115m, peaking at 158m and finishing at 34m.

<u>Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 24)</u>

The concentration in frequency across the histogram bins is between -1 and 1m. The mode is 0. There is however a low spread through the higher values, 1 in the 8m, 2 in the 9m and 1 in the 12m bin. There is no corresponding spread in the negative values.

<u>Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 25) using the Absolute Values</u>

Here it can be seen that the mode is 1 and not 0. This graph assumes that the road was travelled in both directions.

4.5.6 Roman Road 5

Roman road 5, as depicted in the graph, runs north to south coming from Gateshead through Chester-le Street past Durham and on to Sedgefield.

Elevation Against Distance (figure 26)

Roman road 5 cuts north-south through the east of County Durham. As with Roman road 3 the elevation against distance plot shows the variety in the topography covered by the route, with both rises, up to 136m, and falls, down to 18m, in elevation along its length.

Slope in Degrees Against Point Number (50m intervals) (figure 27)

This road shows an interesting result in the slope plot. Again the majority of the points are between -5 and 5m, there is however a value of -23 degrees and one of 19 degrees. These values highlight possible limitations in the plotting of the route.

4.5.7 Conclusion

These routes are what could be expected of a network of Roman roads, predominantly smooth gradients, even if the overall change in elevation is occasionally substantial. Outliers may be a result of the terrain model but steep slopes on Roman roads are not unknown. For example the Military Way was a 'frontier support' road and therefore follows the course of Hadrian's Wall to provide access to the forts and gates along the wall, it necessarily, due to its need to follow the topography wall closely, has many steep sections (Davies 2002: 85, 15).

4.6 Plots Derived from Slope and Elevation Data for Least Cost Routes for Roman Roads 1 to 5

The least cost routes have the same start and finish points as their corresponding Roman road. The routes taken are, however, different and can be seen in figure 29. An overview is provided on how to read the graphs in section 4.5.1. Salient points and interesting patterns discussed by least cost route are provided hereunder. The graphs for the least cost routes for Roman roads 1 to 5 are figures 30 to 44 inclusive and are located in section 12.3.2 of volume 2.

4.6.1 Roman Road 1: Least Cost Route

Elevation Against Distance (figure 30)

Whilst the general trend remains the same as for the actual route, the route actually descends further, to a minimum elevation of 80m. The profile shows a much more even decent before an ascent to the end point. The length of the least cost route is, however, substantially longer, 52,960m against the original route of 34,518m, a 53% increase.

Slope in Degrees Against Point Number (50m intervals) (figure 31)

The maximum slope is -7 degrees which may indicate that the slightly higher values for the actual route are an unavoidable result of the topography of County Durham.

4.6.2 Roman Road 2: Least Cost Route

Elevation Against Distance (figure 33)

The route shows a uniform decent with several plateaus, one at the minimum height of the route at 130m, indicating that the histogram will have a high frequency in the 0m field.

Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 35)

The frequency is the highest in the 0m field, with the results concentrated in the -1 to 1m range. There is a frequency of 1 in the -6m category, which is the same limit as for the actual route.

4.6.3 Roman Road 3: Least Cost Route

Elevation Against Distance (figure 36)

The difference in the profiles for the least cost route and the actual route are markedly different. The least cost route shows a much more consistent elevation during the middle section. As with least cost route or Roman road 1 the least cost route for Roman road 3 is longer, 57,024m against 36,613m, a 56% increase.

Slope in Degrees Against Point Number (50m intervals) (figure 37)

As with the actual route the spread of slope values is wider than that of routes 1 and 2.

Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 38)

The histogram reflects this broader range of slopes with a spread from -7 to 12, the 0m bin is however still the mode.

4.6.4 Roman Road 4: Least Cost Route

Elevation Against Distance (figure 39)

The least cost route shows clear plateaus and has less variation in its overall decent than Roman road 4.

Slope in Degrees Against Point Number (50m intervals) (figure 40)

Although there are three instances of the slope in degrees being 7 degrees the spread is by and large clustered about the 0 degrees line due to the generally flat terrain covered by the route of the Roman road 4.

4.6.5 Roman Road 5: Least Cost Route

Elevation Against Distance (figure 42)

As with the plot for the Roman road 5 there is a great deal of variety in the shape of the profile, showing the variety of terrain covered. The least cost route is again much longer, 57,608m compared to the actual length of 33,734m, a 71% increase.

Slope in Degrees Against Point Number (50m intervals) (figure 43)

13 degrees is the highest value, which represents a much less steep slope than the -23 degrees on the actual route.

4.6.6 Conclusion

The similarity in the results for the slope plots shows that, although the actual routes and the least cost routes are geographically radically different, the slope on the latter routes is not vastly different. The histograms do, however, show much higher frequencies in the 0m category, as would be expected. The -1 and +1 degree bins show higher frequencies for the actual routes indicating that an absolutely flat route was not of prime importance but with the highest frequency being in the 0m category suggesting that maintaining a moderate slope may have been a factor.

4.7 Distances as Potential Determining Factors for the Placement of the Roman Road Network

To get the least possible slope and change in elevation the least cost routes are, on occasion, substantially longer. For example the difference in length between Roman road 5 and the least cost route for Roman road 5 is 23,874m. This extra distance, even though the slope is more even along the route would be likely to have been significant when choosing a route for the road.

To determine whether it was a combination of slope and distance that influenced the Roman roads the difference between the length of sections of Roman road 5 and its least cost path, required to have the same section start and finish points will be studied hereunder.

4.7.1 Distances between fixed points: A comparison between the Roman Road 5 and Least Cost Route 5

See (table 3)

Roman road 5 was chosen to assess the influence of distance, in addition to slope, between points as a deciding factor in the creation of the Roman road, as part of it subsequently became parts of the primary route in County Durham.

The start point for the first section, is the point at which Roman road 5 enters the north of County Durham, the subsequent sections are divided into sections where locational evidence of Cades Road is good and there are other known tie in points of importance along the road.

It is clear from the results in table 3 that even by creating a fragmented route that the least cost route is longer. The case of the initial section from the start to Chester-le-Street the difference is not large, the least cost path being 96m longer (an extra distance of 5%), the last segment however shows that the least cost path is 12,073m longer, the equivalent of that section having an extra distance of 194%, or being nearly 3 times as long.

The other sections also show substantial additional lengths, sections 2 and 3 being 47% longer, section 4 being 49% longer and sections 5 and 6 being nearly twice as long as the Roman road being 94% longer.

This pattern would seem to support the premise that whilst slope played a part in the determination of the route of the Roman roads the overall distance of the route was more influential.

4.7.2 Conclusion

The military and functionalist desire and need for a direct route, with short distances and moderate slopes, can be seen to be key factors in the placement of the Roman roads.

The extra distances seen in the least cost routes represent the idea that a person would be willing to travel substantially further, up to ten times more, in order to avoid a 10 degree slope which, whilst possible, is improbable. For this thesis the slope on which the least cost routes have been calculated have been expressed as a range from 0 to 90 degrees. One way the slope could be investigated further would be to reclassify it in terms of the experience of the slope, for example bands representing low, medium, high and impossible slope. Following the research by Llobera[91] a slight downward incline is the easiest path and so the bands of the experience of the slope could be created to reflect this. Such a re-weighting would be expected to have an impact on the length and routes of the least cost routes making them shorter and more likely to more closely follow the Roman roads.

4.8 Chapter Conclusion

The Roman road network brought a means by which military, economic and social travel could take place. Communication and travel were central to the Roman empire and provided a way for the "*…world to be common to all…*" (Adams 2001: 2). Through the development of a multi-faceted transport network the Romans gave the once disparate parts of the empire connectivity. Indeed evidence of mobility had been used to measure cultural change in Britain during the Roman occupation. The infrastructure encouraged communication and cultural exchange with the centre of the empire allowing even the peripheral regions to come into contact with new ideas, goods, concepts of mobility and changes in trade (Laurence 2001: 93). The success of the network can be seen even today as many modern roads still follow the courses of their Roman precursors. The roads in the period 1530 to 1730 brought with them yet again the concept of national and international connectivity, this time by allowing a changing social elite, the gentry and the rising 'middle-classes', to become more nationally unified in aspirations, fashions and architectural ideals (Brayshay *et al.* 1998: 265).

These ideas of connectivity, changing social structures and architectural styles will be explored further in chapter 7 where archaeological, documentary and architectural evidence will be drawn upon to provide substantiation for the economic and social

[91] See chapter 3 section 3.1.2 and figure 2.

effects of roads and routeways on the north east region and County Durham set in a national context.

"…driving cattle is a mortally slow job,

and we took the better part of a

day to cover 12 miles."

(Buchan 1993: 76)

5 Drove Routes in County Durham

This chapter examines the major drove route network that channelled cattle from Scotland to the large cattle markets in London and the south[92]. It also provides the economic and political context, for these routes, arguing that the development and changes in markets and fairs throughout the county and the changing legislation regarding trade with Scotland, formed an unstable backdrop against which the drove routes were established and used. The assertion that the drove routes themselves dictated the creation and change of some market locations and trade patterns within the county will also be explored.

The historical road-using professions examined within this thesis include those associated with the droving industry. It is central to this thesis that the roads these professions used were forged and driven by these occupational identities, and the identities were formed in part through the use of a specific network type. The opportunities to use the road and the roadscape as indicators of identity, in these contexts, will be examined and the distinct identities of those involved in the cattle trade will be explored as will the unique Anglo-Scottish identity of the Border Reivers.

GIS analysis of the drove routes, including least cost distance analysis, has been used to establish the primary concerns for the routing of the drove routes, using aspects

[92] Localised transhumance and trade routes to local markets will also be examined where pertinent.

affecting the cost grid such as slope, land type and distance. In addition GIS viewshed analysis, which plots what is visible from defined viewpoints, is used to investigate the visibility of the market towns as the drove routes approached them to explore the possibility that the drove routes followed channels of visibility.

5.1 The Drovers' Routes: Routeways Associated with Droving in County Durham

The achievement of political stability between England and Scotland and indeed England and Ireland had a great influence on the drove trade through County Durham. The Medieval period saw substantial trade between Scotland and England, this trade was ad hoc and not widely organised or implemented in a strategic way. With the Union of the Crowns in 1603 the trade increased but was not yet legally recognised. Despite this lack of official recognition figures from tolls levied on the beasts passing through show that in Carlisle in the year 1662-3 over 18,500 cattle entered England by that route alone[93] (Bonser 1970: 74). Between 1666 and 1765 the import of cattle from Ireland was prohibited to encourage internal cattle breeding and trade, this increased the cattle required from Scotland and Wales to serve the increasing demands of an expanding population and from the armed forces (Bonser 1970: 76). The prohibition of the importation of cattle from Ireland was not very successful. It is thought that at least some Irish cattle were brought into Scotland and re-exported from there to fulfil these needs as well as some being imported directly into England through the use of bribes (Brown 1996: 431; Bonser 1970: 75).

In 1704 an Act forbidding the importation of Scottish cattle was passed to 'protect' England from 'the dangers of Scotland'. For four years no cattle were allowed across the border until the Treaty of Union in 1707 (Bonser 1970: 75). Passage of the Treaty of Union in 1707 saw a return to the gradually increasing pattern of trade as had been occurring before the ban. A conservative estimate of the extent of the trade of cattle

[93] Other toll free routes leave estimations of total trade difficult to establish.

flowing from Scotland sits at 30,000 beasts per year in the years following the resumption of trade (Haldane 1968: 168-71; Brown 1996: 431).

5.1.1 The Drove Routes: Physical Characteristics and Maintenance

Drove routes are characterised by their length and also their breadth. Herds as large as three hundred cattle were driven through the countryside usually with one man and one to three dogs to each fifty animals. Thousands of animals traversing the country over the course of a year produced corridor routes up to 30m wide (Addison 1980: 70). Their effect on the landscape can sometimes be seen as holloways[94] as the number of animals wore away the land (Rushworth *et al.* 2005: 1). The drove routes in County Durham were unmetalled routes, forged across the landscape, and as such received no maintenance. If a section of the route became unusable it would simply be avoided. Even the cross dykes[95], used as part of the control of the movement of the animals are, with a few exceptions, thought to be simply re-used Pre-Historic landscape features.

5.1.2 Purpose, Rationale and Usage

The purpose and rationale behind the use of an independent drove route system were both economic and practical. Unmetalled routes suited the cattle better and the use of a separate system minimised disruption to other forms of traffic. Where the use of an independent network was not possible, for example with the routes into London, the congestion caused by the cattle was at times substantial (Bonser 1970: 216).

The drove routes were predominantly used by the drovers on their long journey south. Where other people used the drove routes in Northumberland and County Durham it was common for them to journey with the drovers and their herds as protection (Bonser 1970: 26) as the political instability in the English and Scottish border

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[94] Alternative spellings include: hollow ways and hollow-ways

[95] Discussed further in section 5.2.2.

regions over many centuries created an often volatile Border area. This instability produced the 'Border Reivers'. The Border Reivers had a unique place within the complicated patchwork of Anglo-Scottish identities as they were both English and Scottish, their identity as Reivers, families, with their own loyalties to kin and allies, transcending any national identity (Keeling 1979: 24-5).

Border Reivers are variously described as murderers, thieves, raiders and protection racketeers. From the fourteenth century to, ostensibly, the mid 1600s they raided and stole cattle and goods from locations as far afield as Edinburgh to Yorkshire. Such was their power that they impelled the creation of a unique form of Border architecture: the bastle and brought words like 'bereaved' into the English language (Hepburn and Robson 2000: 3). Bastles[96] were stone built, two storey, defensible farmhouses where the cattle would be driven into the lower floor at night for security, with the family living above. It was not just the farms, however, that were vulnerable to these attacks, so too were the drovers with their valuable herds of cattle (Bonser 1970: 26). The drovers and their animals, through the Border Reivers use of the drove routes, became vulnerable to attack and the drove route itself then provided a suitable route by which to drive the stolen cattle[97] away.

The Union of the Crowns in 1603 saw the accession to the English throne of James VI of Scotland, who then became James I of England. King James I/VI began a process of reducing the power of the Border Reivers, abolishing the Border Laws[98] and replacing the term the 'Borders' with the 'Middle Shires', in an effort to demonstrate the physical union of the two countries. In addition the Border Reivers found themselves the focus of a concerted effort to wrest their power from them through disarming, imprisonment and even through execution. Yet, despite these actions, such was the risk even in the early 1700s that drovers were exempt from the

[96] See appendix 2 for bastle sites in County Durham, collated under 'Drove Data'.
[97] The concept and the use of cross dykes to prevent free movement are discussed in section 5.2 below.
[98] Border Laws were customary laws that had developed around the theft of cattle and goods and the owners' right to reclaim them (Hepburn and Robson 2000).

Disarming Act of 1716[99] and in 1725 could obtain licences to carry 'gun, pistol and sword' (Bonser 1970: 26; Hepburn and Robson 2000; Newton 2007: 100).

The major drove routes were also in part used to facilitate local droving needs when transferring cattle and sheep between farms and land and for driving them to local markets. 'Transhumance' has been used to refer to the transfer of livestock from summer to winter grazing and pastures. McDonnell puts forward the argument that transhumance, in its true sense, should involve distance, duration and semi-permanence (McDonnell 1988: 2). For the purposes of this thesis the broader use of the term has been used.

Work by Rushworth *et al.* 2005 has investigated the patterns of transhumance in the Northumberland National Park, Della Hooke has studied transhumance routes in Anglo-Saxon western England (Hooke 1977; 1985; 1998) and McDonnell has studied settlement and transhumance in North Yorkshire (McDonnell 1988; 1990) but as yet no similar work has looked at transhumance in County Durham.

5.1.3 The Drovers

Droving was a trade that required all those involved in it to be honest and reliable because the cattle could be sold for considerable sums of money, a great distance from their owners[100]. Drovers were well respected and comparatively well paid. An Act of Parliament in England in 1562 required all drovers to be registered[101]. To fulfil the registration requirements it was necessary for a drover to be a married householder and be a minimum age of 30. The licence cost a shilling and was obtained at the Quarter Sessions of the county in which they had resided for at least

[99] They were exempted again in the Disarming Act of 1748 (Bonser 1970: 26).
[100] There is a close link with droving and banking as methods of safely transferring payments without carrying cash developed through the establishment of banks such as the 'Black Ox' in the late 1700s whereby money could be transferred by cheque.
[101] This was in part to allow the enforcement of vagrancy laws rather than in response to any need within the industry (Toulson 2005: 8). Registration continued until 1772 (Brown 1996: 431).

three years. The licence in turn had to be registered with the Clerk of the Peace at an additional cost of 8d[102] (Brown 1996: 431; Toulson 2005: 8).

The term drover is often used generically to refer to the wide range of men involved in the trade, from hired hands through to the cattle dealers, it is apparent, however, that only the 'top men' – those who were in charge of the cattle herds as they were in transit, were licensed (Brown 1996: 429; Bonser 1970: 23-4). Although Justices of the Peace were responsible for the control and licensing of many tradesmen, few records have survived for County Durham because, unlike most counties, lists of badgers[103] and drovers licensed annually were not usually recorded[104].

The drovers through their professional and proficient use of the drove routes to transport the cattle ensured the safe and expedient delivery of the animals to their required destination. This level of professionalism would have developed through continued use and experience of the routes and the surrounding landscapes and through their continued expert use of the routeways their own professional standing would have grown. The economic return, too, through their judicious use of the routes would have been safeguarded.

The fact that the drove routes represented a route whereby the drovers both created the cultural landscape and conferred upon it gendered power gives credence to the postulation that certain routes were imbued with gendered power dynamics. The drove routes were created by men and used by men. Where women did use the drove routes they often did so using the drovers as 'protection', due to their honest reputations and exemption from Disarming Acts[105], thus re-enforcing the masculine perceptions of the routes, their use and their users.

[102] 1 shilling equalling 5 pence and 8d (or 8 old pence) approximately 3.5 pence.
[103] Badgers were itinerant dealers in items and goods such as fish, corn, butter or cheese. The name badger was derived from the French 'bagage' referring to the bags in which they kept their wares.
[104] Only the list for 1745, was entered in a process book (Ref No. Q/S/OP/2 October 1735 - October 1752: 95-97).
[105] See section 5.1.2.

5.1.4 Survival of the Drove Routes

The survival of the drove routes in the landscape has been limited by the preference for unmetalled surfaces that are easier for the cattle to walk upon and also allowed for the "drifting" of routes in times of poor weather. Some of the drove routes across the country are identifiable in aerial photographs and some have become part of a subsequently metalled road. Others have remained as rights of way across the landscape and have been incorporated into walking routes, inspiring books such as 'The Drovers' Roads of Wales' which outlines many walks based around drove routes (Godwin and Toulson 1977). After it has left County Durham drove route 5 extended into Cleveland where part of it is now incorporated into the Cleveland Way[106] (Toulson 2005: 38).

One way that the memory of the drove routes and their use has survived is through oral histories such as that by Harold Slight (Slight 1998) and those collected as part of the Oral History Project which was under taken by Ian Roberts as part of the Northumberland National Park's 'The Drovers' Project' (Rushworth *et al.* 2005: 72). As an example, one of the oral histories describes a time when in 1943 Bob Telford drove his cattle for 45 miles across what has become Northumberland National Park (Northumberland National Park 2005). The oral histories highlight the fact that even though the droving trade had moved onto the railways the drove routes were still being used by local communities as part of the transhumance movement of stock well into the 1950s (*pers. comm*. Roberts 2008).

5.2 The Drove Routewayscape

There are both buried and extant remains of the droving routewayscape across the country. The remains of the routes themselves have, for the most part, been lost due to the cessation of the industry and their associated features such as holloways and

[106] A 109 mile long walking trail through North Yorkshire and Cleveland.

cross dykes are recorded as surviving in Northumberland and not County Durham. The following section therefore includes Northumberland and other areas in the discussion on the drove routewayscape as, an improved understanding of the remains could result in the possible identification of sites within County Durham in the future.

5.2.1 Public Houses, Inns, Stances and Enclosures

The greatest need for the drover and the herd was to find suitable overnight grazing. Half-penny fields or pastures were named for the cost of overnight grazing per animal, some fields and adjacent lanes have retained the name giving an indication of where some grazing points were located. These fields could also be associated with inns and blacksmiths (Godwin and Toulson 1977: 19).

A method of advertising the existence of pasturage and accommodation that was employed by the owners of the inns was to have three trees. In Scotland and Wales these were Scots pine and in England yew trees. Across open landscape the trees would act as markers showing locations for grazing and well as food and accommodation for the drovers (Godwin and Toulson 1977: 19).

What constituted an 'inn' varied from place to place and the use of the terms inn, ale house and tavern can vary, however each had its own definition within the law. English law[107] set down that an inn or victuallage house was required to have one or more spare beds for travellers. These travellers were also able to purchase alcohol outside of the normal sales restrictions times although inns were not obliged to serve alcohol. Ale houses sold alcohol as did taverns although taverns were precluded by law from keeping guests[108] (Parkes 1925: 127; Webb and Webb 1903: 11). In rural Wales and Scotland an 'inn' could often be a farm which brewed extra beer to sell to drovers and travellers (Godwin and Toulson 1977: 18).

[107] Many Acts, Statutes and rulings deal with inns and ale houses as they gradually became licensed and their roles more defined. These include Henry VII Act 11 c. 2 (1495), Act 19 c.12 (1504), Edward VI Statute 5 and 6 (1552) (Webb and Webb 1903: 5).
[108] It is unclear whether it was illegal for ale houses to house travellers but it was not customary.

Welsh drovers are reputed to have taken good care not only of their animals but also of themselves, enjoying the role of story tellers in inns on their way through England and then the bringers of news, politics, fashion and religion back to their rural communities in Wales. This concept of the transport networks created a channel by which information was relayed around Britain thereby enabling 'connectivity' as discussed further in chapter 7. Not all the drovers stayed indoors, it is reputed that many Highland drovers lived a much more spartan lifestyle and stayed and slept outside with the herd[109] (Toulson 2005: 9; Moore-Colyer 2001: 107).

The name of a public house or inn can occasionally also give an indication of their past heritage, with names such as 'Drovers', 'Drovers' Arms' and 'Drovers' Rest' signifying stopping and rest points along the routes. References to the housing of the animals is also known such as the 'Stockyards' in Gloucester. In County Durham a good example of this is the 'Jolly Drovers' pub on the A692 near Lanchester, for which records to the selling of alcohol are extant at this location from the late 1600s (Dunkling and Wright 1994: viii, 78, 253).

5.2.2 Cross Dykes

A cross dyke or cross ridge dyke[110], is a generic term for a mound and ditch, or dyke, often narrow in proportion to their length and used to block the bottom of a hill or ridge. There are sometimes associated with ditches and less frequently may be delimited by a stone kerb. They are notoriously difficult to date and the majority are presumed to be constructed during the late prehistoric period (Keys to the Past 2008b; OED 2010). They are thought to have been used on sections of some drove routes as a means of controlling the cattle in a variety of ways. These include directing the cattle or obstructing their way. Such diametrically opposed uses emphasises the volatile situation in the northern areas such as Redesdale and Coquetdale with the

[109] Although they too would have returned home with the latest information on current affairs.
[110] Alternative spellings include cross-dyke, cross-ridge-dyke and dike.

raids of Border Reivers stealing cattle from farms and driving them north (Charlton and Day 1978: 65; Charlton and Day 1979: 226-8). It was not just the farms that were vulnerable to these attacks, so too were the drovers, such was the risk even in the early 1700s that drovers, as previously discussed, were exempt from the Disarming Act of 1716 and in 1725 they could apply to obtain licences to allow them to continue to carry arms for self defence (Bonser 1970: 26).

There is little evidence for the direct construction of the cross dykes as part of structured engineering works along the drove routes with regard to constraining, directing and easing the passage of the cattle. It is assumed therefore that these landscape features were reused as they provided convenient means of controlling the herd. One example of this reuse is the cross dyke running across the narrow neck of land between Hare Sheds and Uplaw Knowe north of Alwinton in the Northumberland National Park. It is approximately 130m long by 5m wide and is thought to have been a prehistoric boundary. There is a gap in the dyke where a Medieval drove route[111] cut through it as it channelled the cattle south (Keys to the Past 2008a; Charlton and Day 1976: 232).

Those designed to prevent cattle theft are thought to have been designed and constructed throughout the Medieval and Post Medieval period. One such instance is the 44m long cross dyke on Windy Rigg which lies across the drove route on Windy Gyle north of Alwinton and is thought to be of Post Medieval origin (Rushworth *et al.* 2005: 10; Charlton and Day 1979: 227; Keys to the Past 2008c). No examples of cross dykes are recorded as surviving within County Durham.

5.2.3 Holloways

With the huge number of animals crossing the countryside holloways can be associated with drove routes. These troughs in the landscape are dependent not only

[111] Clennell Street.

on the quantity of traffic but also on the drift, the underlying geology and the local climate. Those holloways that survive appear most frequently in hilly landscapes because the wear and erosion is greater on convex slopes. As with cross dykes they are difficult to date conclusively (Muir 2000: 194-5). No examples of holloways associated with drove routes are recorded as surviving within County Durham.

5.2.4 Blacksmiths and Cattle Shoes

Even using optimum routes for the cattle the beasts still needed to be shod. Unlike horses that can be shod with a single shoe the cattle's hooves, being cloven, necessitated the use of two piece shoes[112]. This work was carried out by specialists in the cattle's home countries of Scotland, Ireland and Wales. Additional specialists along the routes, especially near areas of rougher terrain are recorded often through records of boasting as to who could shoe the most beasts, or through competitive claims over the number of nails used, as in the case of a blacksmith near Boroughbridge claiming to get through 30,000 specialist nails a year (Toulson 2005: 23; Addison 1980: 74). Surprisingly few of these nails or shoes are found in the landscape, and there are none recorded in the Durham HER[113].

5.3 Markets and Fairs

Markets were held weekly at towns throughout County Durham where farmers brought surplus produce to sell alongside specialists such as the 'hatter from Hexham' who is known to have frequented the markets around County Durham together with drapers from as far a field as York and Newcastle. For the most part, however, they provided the local communities with their general requirements of wheat, meat[114], fish, potatoes, cheese and butter (Fraser 2000: 23).

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[112] Examples can be seen in the Weald and Downland Open Air Museum, West Sussex (Toulson 2005: 23).
[113] Historic Environment Record, see appendix 2 for sites relating to cattle and droving.
[114] Fresh and cured.

Fairs were less frequent, often annual events, and provided an opportunity to purchase more unusual and specialised products, and also to socialise and to be entertained (Epstein 1994: 461). Where markets provide food and exchange of information Kerr Cameron defines the role of the fair as "*…knitt*[ing] *the social and economic fabric of the nation…*" (Kerr Cameron 1998: 11). For example the entertainment provided a much needed diversion from the mundane drudgery of normal life (*ibid*: 1). Such was the reputation of fairs for un-Godly behaviour that in 1668/9 Stanhope's Good Friday fair was brought forward two days to the Wednesday before Easter because of the Bishop's disproval of licentious behaviour and drunkenness (Ref No. EP/St 1/3 1668-9: 10-11).

The number, location and type of markets and fairs, are necessarily closely tied to population and the economy. Aspects of the rural economy are discussed in Kussmaul 1990 and Thirsk 1984, with Braudel 2002 and Spufford 2002 providing European contexts for the shifts in economy and trade. The marketing of produce is examined in depth in Everitt 1990 and Chartres 1990.

5.3.1 Markets in County Durham

The pattern of markets changed throughout the fourteenth to the sixteenth centuries as the population decreased and centres of trade became fewer and more centralised (Dyer 1989: 325). The areas that markets served increased and the markets themselves gradually became more specialised. This specialisation can be clearly seen when looking at the trades and goods of the 800 or so markets in England. Around 300 were for single trades such as swine, grain and cattle and six were devoted entirely to fruit (Braudel 2002: 43).

Within County Durham this shift can be clearly seen because before 1516 the major market towns of the County were Barnard Castle, Bishop Auckland, Chester-Le-Street, Darlington, Durham, Gateshead, Greatham, Hartlepool, Norton, Sedgefield, Staindrop, Stanhope, Stockton and Sunderland[115] but by 1702 only six of these (Darlington, Barnard Castle, Bishop Auckland, Sunderland, Durham and Stanhope) are listed as the core market locations with the addition of Wolsingham (Letters 2007; Harbin 1702: 65). Other towns may have continued having local markets but the main market trade had shifted to fewer more powerful centres. Wolsingham was granted its market charter in 1615[116] would seem to go against this general trend of contraction which, in County Durham gave rise to a halving of the number of market towns during this period. Wolsingham, as a nodal point on the route of several drove routes suggests that these routes were a factor in its successful, but relatively late development.

In addition to the drove routes, the growth of the lead trade in the North Pennines from the 1600s onwards created new settlements in the west of County Durham. This populating of the upland areas coincided with a rise in consumerism, as discussed, for example, in Lemire 1990; Johnson 1996; Weatherill 1996; Dyer 2005. Settlement studies associated with industry have, however, tended to concentrate on urban growth through the industrial revolution in the later eighteenth century for example Stobart 1996; 2000: 159, by which point the settlements associated with the lead mining industry had changed in character with mass emigration[117] from the Pennines taking place during this period (Raistrick and Roberts 1984).

The combination of increased settlements, increasing patterns of consumption and the use of the drove routes would fit with the fact that, although the drovers would have brought some trade to the market towns the fairs and markets for the selling of the cattle were often further south, making them unlikely to be the sole contributing factor in the market pattern of County Durham. This use of the drove routes through

[115] Darlington, Stockton and Sunderland are outside the study area for this thesis but were part of County Durham during this period.
[116] in 1667 the charter was endorsed with the allocation of land on which markets and fairs could be held (Anonymous 2008).
[117] Often to America (Forbes *et al.* 2003).

County Durham as transit routes is evidenced by the proliferation of place names referring to areas for fattening the cattle in counties such as Suffolk and Norfolk. Place names including the use of ‘Green’ for example Smith’s Green, indicating the pastures used for the fattening of the animals after their long journey and before their final leg of the journey south to London, the name ‘Butcher’s Pasture’ west of Bishop’s Stortford a reminder of the fate of the animals at the end of their journey (Brown 1996 and *pers. comm*. Hutton 2009a; 2009b).

5.4 The Decline of the Drove Routes

Whilst the turnpikes were seen as a costly nuisance by the drovers who, where they could, navigated around them often using routes parallel to them, the advent of the railways in the nineteenth century saw the end of the long distance drovers. The decline was in some respects gradual, whilst the railway network was developing. The cattle still needed driven to the railheads but as the network expanded these droving distances gradually became less and less so that by the mid 1800s the broadscale network had become largely redundant (Hindle 2001: 69). The reduction in traffic on the drove routes caused by expansion of the railways was compounded in the north east in the 1830s when steamships also came to be used to export the cattle out of Scotland (*pers. comm*. Roberts 2008). Even though the broadscale use has long since ceased the oral histories are testament to the fact that sections of the routes continued to be used for droving cattle well into the twentieth century.

5.5 GIS and Graphical Analysis:

5.5.1 Aims of the GIS Analysis

The aim of the GIS analysis of the drove routes is to establish the primary concerns for the routing of the drove routes. Slope and land use are studied to see how the network was influenced and controlled by the cattle’s need for grazing and manoeuvrability. GIS viewshed analysis is used to investigate the visibility of the market towns as the drove routes approached them to explore the possibility that the drove routes followed channels of visibility. The ideas of this visibility and the views to and from the drove routes are then explored in terms of the experienced taskscape and professional identity.

5.5.2 Issues Pertinent to the Drove Routes

The questions of who established, permitted and controlled the drove routes are interesting because they, like the Roman roads were part of a broadscale network. The Roman routes as seen in chapter 4 established to form and organised military, ideological and economic infrastructure system. The Romans were a conquering force and therefore the need for permission was negated. They then clearly controlled and maintained the roads. The drove routes represent the antithesis of this; they were a system independent from the other transport networks and became established through habit. This establishment through habit that seemingly gave them freedom from permissions and control and it is only during the increasing enclosure of farm land that land owners ‘reclaim’ their land by enclosing it, illustrating that whilst the drove routes were well established as having customary rights they were not seen as having any legal priority. In County Durham the enclosure of the land used by the majority of the drove routes was not a problem until the late eighteenth century (Roberts *et al.* 2010: 74). The constraints of the landscape, in terms of slope and the land use patterns for grazing for the cattle are therefore key aspects for the creation of the drove routes which the GIS analysis investigates.

As with the Roman roads scale is important, the drove routes were long distance routes and the start and end points for drove route 1, 2, 4 and 5 are arbitrary points where the routes enter and exit what is now County Durham. For drove route 3 the start and end points are where the route meets route 4 and route 2 and could have formed part of a longer route incorporating these routes.

The drove routes were mapped using a variety of resources[118]. The fact that they are corridors of movement rather than carefully defined, metalled roads an influencing factor when choosing the grid resolution for the GIS, to try to minimise the effects of any sections of the route that have associated error crossing the different cells.

5.6 Plots Derived from Slope and Elevation Data for Drove Routes 1 to 5

From the seven drove routes studied five routes were selected (see figure 45). The five routes selected for further analysis were selected as being comparable to the five Roman roads, that is, cutting across the county north to south and a linking route between these. The graphs for the drove routes 1 to 5 are figures 46 to 60 inclusive and are located in section 12.4.1 of volume 2. As in chapter 4 commentaries are only provided on graphs with noteworthy features.

5.6.1 How to Read the Graphs

A detailed review of how to read the graphs can be found in chapter 4, section 4.4.1.

The histograms for change in elevation between points at 50m intervals for the drove routes would be expected to be within the -2 to +2 range, as for the Roman roads, due to the restrictions of travelling with cattle.

The drove routes were anisotropic, and used primarily in one direction[119], the graphs and histograms therefore reflect the direction of use.

5.6.2 Drove Route 1

Drove route 1 enters County Durham from the west, and would have been used by cattle being driven from the west and central Scotland, perhaps entering England at

[118] See chapter 3, section 3.2.2
[119] See section 3.1.2: Isotopic and Anisotropic Journeys.

Carlisle, but more likely to have crossed the border south of Hawick. The route heads south, exiting the county past Bowes.

<u>Slope in Degrees Against Point Number (50m intervals) (figure 47)</u>

The majority of the route has a slope of between -10 and 10 degrees. One section of the route, however, has a steep decent of -24 degrees (a gradient of 1:4), and then a steep accent of 31 degrees (a gradient of 1:3).

<u>Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 48)</u>

The histogram shows the varying topography crossed by the route and these extremes as 1 result in the -20m field and 1 in the 32m field. The majority of the route has changes in elevation between points of between 0m and 3m.

5.6.3 Drove Route 2

Drove route 2 enters County Durham from the north, having crossed into England south of Hawick. It heads past Stanhope, to Barnard Castle then out of the county and on to Scotch Corner.

<u>Elevation Against Distance (figure 49)</u>

The route starts smoothly at 533m then the height decreases, rises again before descending to 214m. Another series of peaks and troughs take the route back up to 512m and down again to 153m, the final decent being gradual.

<u>Slope in Degrees Against Point Number (50m intervals) (figure 50)</u>

The maximum slopes for route 2 are considerably less than those for route 1, -15 degrees and 13 degrees. Most of the slope is between -10 and plus 10 as with route 1.

5.6.4 Drove Route 3

Drove route 3 links drove route 4 to drove route 2, cutting across the county from Wolsingham to Barnard Castle.

Elevation Against Distance (figure 52)

The overall change in elevation over this route is not large being from only 182m to 155m. This is not, however, one steady decent, with a maximum elevation of 370m and a minimum elevation of 135m being traversed en route.

Slope in Degrees Against Point Number (50m intervals) (figure 53)

All of the slope values are between -15 degrees and 15 degrees. As with routes 1 and 2 most of the slope is between -10 degrees and 10 degrees with the lowest values over the final third of the route, shown as a more gradual decent in the elevation profile.

5.6.5 Drove Route 4

Drove route 4 enters County Durham from the north having crossed into England further east than drove routes 1 and 2 at Carter Bar. Its course through County Durham took it to Wolsingham, where route 3 would have connected it to route 2 whilst route 4 headed south to Cockfield Fell and on to either Scotch Corner or Darlington.

Elevation Against Distance (figure 55)

The profile of the elevation graph for drove route 4 reflects the varied topography of County Durham as the route heads south across the county. As it enters County Durham the elevation is 190m, as it leaves the elevation is 92m, the journey in between, however, there is a climb to 369m and many other climbs and descents on the journey.

Slope in Degrees Against Point Number (50m intervals) (figure 56)

As with routes 1, 2 and 3 most of the slope is between -10 degrees and 10 degrees with the lowest values over the final section of the route, shown as a more gradual decent in the elevation profile. A maximum slope of 26 degrees, a 1:4 gradient is the single most striking gradient on the route.

5.6.6 Drove Route 5

Drove route 5 enters County Durham from the north having crossed into England further east than drove routes 1 and 2 at Carter Bar and diverging from drove route 4 at Corbridge. From Corbridge drove route 5 roughly follows the course of the Roman road Dere Street before heading past Durham City on the way to Sedgefield, following a route more akin to the course of the Roman road of Cades Road.

Slope in Degrees Against Point Number (50m intervals) (figure 59)

The slope, is for the most part, between -5 degrees and 5 degrees. The maximum slope is -18 degrees.

5.6.7 Conclusion

The difference in length between the horizontal distance and the actual distance traversed (table 1) are between 70m extra for the traversed distance for route 5 and 139m extra for route 1. The routes themselves are all over 3500m in length and so this extra distance is not a large percentage of the total route 0.38% for route 1.

Like the Roman routes, along which there were some extreme outliers, with the drove routes there are also some high maximum change in elevations, for example 32m for drove route 1 and 26m for drove route 4. The slope for the drove routes is predominantly maximised between -15 degrees and 15 degrees, however the slope maxima for the drove routes 1, 2, 3, 4, 5 are 31 degrees, 13 degrees, 15 degrees, 10 degrees and 5 degrees respectively.

These results are generally comparable to the lead routes, as can be seen in chapter 6. This is likely to be due to both sets of routes catering for animals. The outliers for the drove routes are, however, much more substantial when compared with those of the lead routes. The probable reason for both the large outliers for both the change in elevation graphs and the slope plots is that drove routes were not narrowly defined 'roads' *per se* therefore if an ascent of 25m was required over a 50m stretch of the route, as seen in route 4, it is more probable that the route took a broader, longer course round the feature.

5.7 GIS and Graphical Analysis: Plots Derived from Slope and Elevation Data for Least Cost Routes for Drove Routes 1 to 5

The least cost routes have the same start and finish points as their corresponding drove route. The routes, however, are very different and can be seen in figure 45. The graphs for the least cost routes of the drove routes can be found in volume 2, section 12.4.2 figures 61 to 75 inclusive. As before only selected observations are presented hereunder.

5.7.1 Drove Route 1: Least Cost Route

<u>Elevation Against Distance (figure 61)</u>

The route depicted in the graph profile is one that comprises a moderate descent then a moderate ascent, with plateaux along many sections. Of all the least cost routes for the drove routes this one has the smallest amount of additional distance to achieve the smoother route, this amount represents, however, a 38% increase in length.

5.7.2 Drove Route 2: Least Cost Route

Elevation Against Distance (figure 64)

The profile shows a section of pronounced descent before a section of gradual descent to a height of 76m and a gradual climb to the end point. The least cost route is 87% longer than the actual route.

5.7.3 Drove Route 3: Least Cost Route

Elevation Against Distance (figure 67)

Even though it is 39,756m (95%) longer than the actual drove route there is a climb to 255m and additional climbs and descents, including a descent to a minimum of 45m.

Slope in Degrees Against Point Number (50m intervals) (figure 68)

The majority of the route has a slope of 0 degrees. Only two points are outside the -10 degrees to 10 degrees range, one being 11 degrees and the other being 12 degrees.

5.7.4 Drove Route 4: Least Cost Route

Elevation Against Distance (figure 70)

The profile of the route shows a maximum elevation of 252m and a minimum elevation of 37m. There are several climbs and descents but the latter section of the profile is mostly smooth. The least cost route is 104% longer than the actual route.

Slope in Degrees Against Point Number (50m intervals) (figure 71)

The climbs and descents are visible as high slope in degree values, -9 degrees, -13 degrees and 15 degrees. The remaining points are, for the most part between -1 degree and 1 degree.

Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 72)

The histogram also reflects the predominantly smooth route, the 0m bin being the mode.

5.7.5 Drove Route 5: Least Cost Route

Elevation Against Distance (figure 73)

There is an ascent to 270m followed by a trend of descent. A minimum of 35m is reached along a small section which necessitates a descent and then a climb. The least cost route is 69% longer than the actual route.

Slope in Degrees Against Point Number (50m intervals) (figure 74)

The descent to the 35m section and the subsequent climb is shown in the slope graph as a -15 degrees point and a 15 degrees point. It can be seen, however, that most of the points are on the 0 degree line.

5.7.6 Conclusion

The similarity in the results for the slope plots shows that, although the actual routes and the least cost routes are geographically radically different, the slope on the latter routes is not vastly different. The least cost histograms do show much higher frequencies in the 0m category. The -1 and 1 degree bins show higher frequencies for the actual routes indicating that an absolutely flat route was not of prime importance. The high results in the -1m, 0m and 1m bin in the change of elevation histograms for the actual routes are similar to the pattern shown by the Roman roads rather than by the lead routes.

The overall spread of the change in elevations is broader for the actual routes when compared to their least cost routes with most results being between -10 and 10m. This broader spread would perhaps be expected along a more direct route.

As with the actual routes of the Roman roads, along which there were some extreme outliers, with the drove routes there are also some high maximum changes in elevations, for example 32m for drove route 1. With the least cost routes this level of change is avoided, the maximum change in elevation being 14m as seen for least cost paths of drove routes 4 and 5. The exchange for the reduction in change of elevation is a dramatic increase in length, this being the greatest with least cost route 4 which is more than double that of the actual route.

With the slope for the actual routes being predominantly between -15 degrees and 15 degrees and with a broad spread of change in elevations the drove routes are broadly similar to the lead routes, as can seen in chapter 6. This is likely to be due to both routes catering for animals. The outliers for the drove routes are however much more substantial compared to the lead routes. As discussed above the drovers routes are not narrowly defined 'roads' therefore if an ascent over a stretch of the route was required, it is likely that the route would have taken a locally broader course to avoid this, given the restrictions and financial imperatives of travelling with cattle the choice of route would not, however, have been a course entailing a doubling of the distance travelled as seen with the least cost routes. The approach of banding the slope into experience of the slope could be an appropriate development of the GIS analysis[120].

To get the least possible slope and change in elevation the least cost routes are, on occasion, substantially longer. For example the difference in length between drove route 4 and the least cost route for drove route 4 is 41,043m. This extra distance, even though the slope is more even along the route would be likely to be significant when choosing a route, especially when considering that it was cattle being driven along the routes, large amounts of extra distance would have increased the time of the journey, increased the need for grazing points along the way and decreased the profitability of the droving business. When the cattle were already travelling almost the entire length of the country the route would not have been made unnecessarily longer.

[120] See chapter 4, section 4.7.2.

As seen, in section 5.1.3, the professional title of 'drover' was one which conveyed professionalism. This was based on the drovers' reliability and the expedient delivery of saleable animals. Additional distance would have led to the cattle requiring more time for fattening in areas such as Suffolk before the final push into London, decreasing profit margins. If more time was taken there was more chance that the valuable cattle would be lost to theft or illness. The whole industry depended on a regular turnover of beast during the seasons when travel was feasible. So if non-essential distance, and therefore time, was added to the journeys this constant flow of animals into the capital would have become a slow ebb. It is clear therefore that through their astute creation and maintenance[121] of the drove routes, through sustained use over time, the drovers provide and used an economically viable taskscape, based in part on the imperative of distance and in so doing strengthened the reputation of their profession and their own identities.

5.8 Land Use Types as Potential Determining Factors for the Placement of the Drove Routes

To determine whether land use types were a consideration for the drovers creating and using the drove routes, the land use types crossed by the drove routes and their least cost paths were calculated. This was achieved by using the map calculator functionality of the GIS, whereby the number of cells (each 50m x 50m) crossing each land type was generated. This data set was then used in Excel to calculate the area and the percentage areas of both the roads (or least cost routes) themselves and County Durham were calculated (see table 4). The results for the drove routes can be seen in figure 76. The results for the least cost routes can be seen in figure 77. A simplified stacked representation can be seen in figure 78.

[121] In terms of continued presence in the landscape.

One of the limitations of the research into the types of land use crossed by the drove routes and their least cost paths is that the detailed land use data is modern day. The drove routes through County Durham were in consistent heavy use until the mid 1800s when the use of steam ships for transport out of Scotland and then the railways removed the need for the cattle take the journey on hoof (Roberts *et al.* 2010: 73). Their use on a smaller scale however continued into the twentieth century as part of localised marketing and transhumance networks and so, despite the fact that land use has changed considerably in the last 50 years, it was decided that for the purposes of this broad scale study that this modern data set would have to provide adequate information.

It is perhaps not surprising that the drove routes predominantly cross land types associated with grass such as rough grazing (26% for drove route 1), moorland grass (42% for drove route 1) and pasture farmland (54% for drove route 3). What is perhaps a result worth considering is the large amount of arable farmland crossed, 41% for drove route 5. At face value having herds of cattle crossing arable land would be detrimental to the crops but, considering the fact that the routes were corridors of movement and potentially flexible in their placement from one year the next the value of having hundreds of cattle on land used for arable as a system of rotational fertilizer provision is clear and beneficial, thereby partially offsetting the inconvenience. The overnight grazing fields could also be varied as required too, thereby maximizing the advantages of having droves of cattle passing through (Bonser 1970: 205).

The least cost routes show much larger results for the urban category, whilst it must be remembered that the land use types are modern and therefore comprised of a greater amount of 'urban' than would have been there during the study period of 1530-1730 the drove routes would have, for the most part avoided passing through more urban areas than was necessary. That is not to say that they were not driven through urban areas, as can be seen for the results of the land types crossed by the actual routes, as cattle were being driven to market, often to London, where they would have had to navigate and traverse the streets of the capital, a far cry from the grassy moorland of County Durham. The least cost routes show lower results in the variety of grass land covered, which even despite their length, would have made them even less suitable for the cattle.

5.8.1 Conclusion

There is a fine line between herds of cattle destroying crops and damaging land and herds of cattle providing fertilizer, it is likely that the routes would have stayed approximately the same, perhaps with some drift and that the overnight grazing points in areas of arable would have been rotated to minimise damage and maximise the benefits.

In addition to a route which was economical in its use of distance and with a slope suitable for the animals the requirement for grazing was better served by the actual routes than could be by the least cost routes.

One way in which use of the modern land data could be developed would be to investigate the ways in which modern land use has created patterns of survival and recognition of the drove routes for example as holloways.

5.9 *Viewsheds and Visibility as Potential Determining Factors for the Placement of Drove Routes*

"Do not go where the path may lead,

go instead where there is no path and leave a trail."

(Emerson 1803-1882)

5.9.1 Visibility

The concept of visibility affecting both the users' perceived and actual experience of a road is clearly present in the Statute of Winchester of 1285 which protected the traveller and in doing so improved the visibility on the rights of ways between market towns.

> *"…it is commanded that highway's* [sic] *leading from one market town to another shall be enlarged, whereas woods, hedges, or dykes be, so that there be neither dyke, underwood, nor bush whereby a man may lurk to do hurt, near to the way…"* (The Statute of Winchester 1285: Adams and Stephens 1930:43).

These requirements were taken seriously and there are surviving records of court cases in which men were prosecuted for allowing hedges to be too close to the highway (Hindle 2001: 41 and Flower 1923: xvii), the visibility allowing the traveller safe passage and peace of mind.

Whereas the Roman roads were initially laid out and created by surveyors and engineers the drove routes were created by the movement of people and cattle across the landscape over more than four centuries. The concept of lines of movement manifest in the landscape through erosion caused by animals and humans is one that is evidenced everyday as we see 'short cuts' of bare compacted soil cutting across grass where people have simply followed the shortest route rather than using the route of the footpath provided. These lines have commonly come to be called desire paths or desire lines, terms first created by Bachelard in his work 'The Poetics of Space' (Bachelard 1964).

The creation of desire lines is closely bound by the ability to see the point to which the person, or animal, desires to go. GIS viewshed analysis was therefore used to investigate the visibility of the market towns as the drove routes approached them to explore the possibility that the drove routes followed channels of visibility.

Two of the theoretical areas into which the study of GIS viewshed analysis has developed are those of 'cognitive archaeology' and 'perception'. 'Cognitive archaeology' is a movement that aims to integrate the use of cognitive and symbolic analysis into the interpretations of early societies (Johnson 1999: 189). This field of study looks at vision in a number of important ways. It looks at field of depth, the relationship between shape and distance and the effect that light, pattern and colour have on our view of the world (Segal 1994: 24-5). The study of 'perception' takes this one step further for example trying to envisage an understanding of the feelings evoked by a certain view (Thomas 1993: 35). It is these theoretical perspectives that will allow viewsheds to be used convincingly in the archaeological issues that are currently being debated such as the politics of vision and the phenomenology of the landscape.

This concept of perception and the feeling that a view creates are complex when considering roads and routeways. The idea of Ingold's cognitive ordering of space allows the routes to be the view point and the view, provide access to the experience and provide the arena for the creation of the experience[122] (Ingold 1993). The drove routes are prime examples of this, they created a changing landscape experience for

[122] See chapter 2, section 2.4.4.

those who travelled along them and created a changing landscape experience for those who viewed the cattle and drovers using the routes.

The drove routes for example would have created their own, distinctive, smells and sounds as herds of hundreds of cattle passed by. Oral histories from those who experienced this view of the landscape talk about the sights and sounds that were created. "*The great feature of the droves was the noise they made.*" (Godwin and Toulson 1977: 8), for together with the drovers making noises that *"…capable of arresting the countryside."* (*ibid*: 9), the sounds of the dogs and the cattle were such that the drove would be heard before it was seen. When they came into sight the drove passed slowly by, with an average speed of six or seven miles per day the progress was deliberate and the speed calculated for the animals to loose as little weight as possible whilst keeping to a schedule (Roberts *et al.* 2010: 63). Knowledge of the approaching droves was important to both farmers and the market towns. The farmers needed to pen in any of their own animals, lest they become part of the travelling herd. The market towns where stock was to be sold, were approached the day before market day, and the animals put into field and holdings on the outskirts so as to be well fed and rested before a short journey to market before dawn the following day. Knowing the herds were approaching the market allowed again the enclosing of farmers own stock and the preparation of the holding sites for the drove itself (*ibid*: 63-64).

5.9.2 Viewshed Analysis

The market towns of Wolsingham and Stanhope were selected to investigate the possibility of desire lines helping to create the drove routes. In addition to the five main drove routes as discussed for the least cost analysis additional drove routes, which were secondary to the main routes and used in the locality of Wolsingham and Stanhope were added to the GIS. Drove route 6 links Stanhope to Wolsingham whilst drove route 7 is a section of drove route that veers from drove route 4 at Manorhouse coming into Wolsingham from the north north west to rejoin drove route 4 which enters Wolsingham from the north north west (see figure 79).

As discussed in chapter 3 the concept of viewsheds along routes is complex as the view point is on the move rather than stationary, as say with a watch tower. It was therefore established that there was reciprocal visibility, where visibility existed, at set points along the routes, 1km, 850m and 500m, in order to justify the use of viewsheds from the towns rather than the viewsheds from the routes themselves.

Figure 80 shows the viewshed of the visibility from Stanhope. The approach of drove route 2 is across an area of good visibility. As drove route 2 and drove route 6 leave Stanhope they do so through areas where the viewshed shows there to be no visibility.

Figure 81 shows the viewshed of the visibility from Wolsingham, which shows greater all round visibility than figure 80. The approach of all the drove routes shown is through areas of visibility. Drove route 6 and drove route 4 are noticeably following channels of visibility. As the routes depart from Wolsingham they do so along routes with less clearly defined channels of visibility.

Figure 79 shows the result of a map calculation, adding the visibility from Stanhope to the visibility from Wolsingham. The result is a figure which shows where was visible from at least one of the towns and the areas that were mutually visible, that is visible from both locations[123]. The routes do not cross any areas of mutual visibility, but what the combined viewshed shows is that drove route 6 does seem to follow an extended length of visibility as it approaches Wolsingham.

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[123] For further discussion on mutual visibility see section 3.1.4.

5.9.3 Conclusion

Whilst it must be remembered that the viewsheds represent a view across an unfurnished and unvegetated landscape, the results of the viewsheds highlight some interesting patterns. All the routes, to varying degrees, do seem to approach the town through areas of good visibility. Their departure from the towns seems to be less bound by the need for visibility. The tentative conclusion that visibility on the approaches to droving destinations may have been one of the causes for the placement of the route is therefore presented.

To support the GIS work 'ground truthing'[124] was carried out at two accessible points on the approach to Wolsingham and one on the approach to Stanhope on foot paths, part of which followed the drove routes. Then on the exit routes from the towns, including the fording point at Stanhope. This check supported the findings that visibility was good on the approaches and less so on the departures

To obtain a more realistic landscape model for the application of viewsheds to routeway analysis, furnishing the landscape with the necessary forest or terrain data would require knowledge of past vegetation and its reinstatement. Woodland is pertinent to large areas of Britain and has been discussed by a number of authors when assessing their own work (Wheatley 1995, 2002). For the most part generalisations are made, although some reconstruction with palaeo-environmental data has been carried out (Van Leusen 1999a: 218). Techniques that could be used to reduce the effects of this bare landscape include: adding height to cells equivalent to the height of areas of known forest. It can be difficult however, to know exactly where the trees were, and how they affected the visibility but as seen in section 5.9.1 the fact that the woods, hedges, bushes and under wood either side of a highway leading to and from market towns were required by law to be kept clear to improve travel safety shows that the issue of visibility along roads was important enough to be protected by law (Adams and Stephens 1930: 43).

[124] The term 'ground truthing' refers to data and information collected on location (OED 2010).

Roads control the 'being in the world' view and unlike the static monuments studied, for example, by Tilley (1994), roads create a mobile and changing world view. Work on visibility around Stonehenge demonstrates examples of the changing visibility of monuments as the view point moves along a path (Exon *et al.* 2000: 126; CD ROM). Taking multiple points along the routes and creating cumulative viewsheds could be a development for this work on visibility, given the technological developments which ArcGIS now presents over the ArcView software which was used for this thesis[125].

As the oral histories show, the reality of living and experiencing is not tied to one sense. There is very little that we can actually learn about how people in the past linked their other senses into their landscape or monuments. For example, just as droving created sounds and smells as well as sights, stone circles could have been surrounded by chimes, lit by fires at night or encircled by the aroma of rotting offerings all of which are no longer present in the archaeological record (Van Leusen 1999a: 220). Following on some seminal work in other disciplines, archaeologists are becoming increasingly aware of the cultural and historical importance of the senses in their research (Classen 1993; Classen *et al.* 1994; Bruck 2005; Classen 2005; Scarre and Lawson 2006; Giles 2007).

The possibility of 'sense-shed' mapping the areas in which the monuments could be perceived is perhaps the next step in using GIS to study a more 'real' past. For the drove routes, taking on board the oral histories both sight and hearing were important to the drovers and those they encountered en route. Making the assumption that viewing space was the primary or only perceptual category in the past could therefore be seen as naïve and work to address these issues can be seen in "Seeing is Perceiving" where Frieman and Gillings investigate two potential methods for creating a more rounded sensory analysis and raise important questions, asking why

[125] See section 3.1.

views, viewing and viewsheds have become the focal sense in GIS investigations (Frieman and Gillings 2007: 37).

5.10 Chapter Conclusion

The drove routes provided a system whereby cattle could be moved through County Durham with the least inconvenience to both the drovers and the residents and this is reflected in the land use types crossed. The creation of the drove routes was driven by a need to maintain a suitable gradient for the animals for as much of the journey as possible, the need to feed the animals and a probable preference for maintaining visibility along the routes on the approaches to droving destinations.

The drove routes also helped to create and maintain the identities of those that used them. The Border Reivers with their strong, independent Anglo-Scottish identities used them to steal cattle. The drovers, on the other hand, through their particularly professional and proficient use of the drove routes to transport the cattle ensured the safe, expedient delivery of the animals to their contracted destination, thereby re-enforcing their identities as professional, respected, honest and diligent men and creating dynamic gender powered routes.

Whilst the drove routes played a role in the market and trade patterns of County Durham, the shift in the location and numbers of markets in County Durham was due to a number of factors. The overall contraction responded to the national imperatives and changes, but with the expansion in the west of the county due to the droving trade and the lead mining industry bringing with them new settlements, new economies and driving new patterns of consumption.

The routes were so successful that they continued in use for driving cattle into the twentieth century and still survive, in parts, as rights of way. Lead routes also survive as rights of way and it is the creation of a network type for the expanding lead industry which is the focus of chapter 6.

"…the old road followed a circuitous route over
hill and dale of inconvenient steepness…"
(Sopwith 1833 in Linsley 1992: 77)

6 Lead Routes in County Durham

This chapter investigates the use of the lead industry routes that were created with ostensibly economic imperatives. Additional dynamics of the time and place are explored, including the examination of land use patterns in this liminal agricultural landscape and with the requirements of the routes bounded by the use of horses. The use of pack animals and then waggonways in the bourgeoning coal industry are compared, as are the effects of the land and mineral rights in the Post Reformation period.

The routes that professions associated with the lead industry, such as the miners, smelters and the jaggers, used were forged and driven by these identities, and the identities were formed in part through the use of a specific network type. The opportunities to use the archaeology of the road and the roadscape as an indicator of identity, in these contexts, are examined in this chapter. The professions within this chapter are, for the most part, those associated with the lead industry, which is seen as a predominantly male world. Gender roles and the identities of women and children within the lead mining industry however, are also explored. The additional usage of these routes by trade professions such as chapmen and pedlars is also considered.

GIS analysis of the lead routes has been used to establish the primary concerns for the routing of the lead routes, using aspects affecting the cost grid such as slope, land type and distance.

6.1 Lead Routes: Routeways Associated with Lead Mining in County Durham

6.1.1 Lead in the Pennines

During the eighteenth and nineteenth centuries, the North Pennines' ore field, at the western edge of County Durham, was held to be the most important lead mining industry in Britain[126]. Now an Area of Outstanding Natural Beauty, the North Pennines are a complicated patchwork of rocks. The base is granite supporting limestone and sandstone (Turnbull 1985: 3). The mineral veins of the Pennines sought by the lead miners were those that contained 'galena', a heavy metallic lead sulphide mineral comprising approximately 87% lead, 13% sulphur and a trace amount of silver. These mineral veins of galena, found with other mineral deposits such as quartz, zinc blender and calcium carbonate, often ran vertically down for over a mile, but not withstanding technical difficulties there are over four hundred named veins in the region (Dunham 1992: 1).

6.1.2 Lead Mining before 1530

It is thought that the Romans mined the lead, in County Durham as they did in other areas of England such as Shropshire and Yorkshire, however, no direct archaeological or documentary evidence has been found to support this conclusively in the study area. There have been finds of Roman coins near Slitt vein near Westgate and there is some debate as to the origins of an earthwork site near Hamsterley which some people propose was a Roman prisoner camp used to supply labour to a lead mine (Forbes 2000: 6).

Slag associated with lead smelting at a site on Bollihope Common has been typologically dated to the late Roman or Medieval period and a radio carbon date from the site has given a date range of AD 880-1030. The road from Stanhope to Eggleston was built by the London Lead Company in the 1800s and overlays a road

[126] The evidence for which can be seen in appendix 2.

with Roman origins. Margaret Manchester suggests that the Roman road through Weardale was in part to serve the requirements for lead created by the construction and garrisoning of Hadrian's Wall (Manchester 2002: 101) although this is seen as a theoretical hypothesis (Bidwell and Hodgson 2009)

Documentation pertaining to lead mining in County Durham, however, goes back only to the Anglo-Saxon period. Bede records the Anglo-Saxon use of the regional resource, relating tales of market place haggling over the price of lead (North East History 2003). In the twelfth century lands in the lead rich Weardale were gifted to the Bishop of Durham, Hugh Puiset[127], by King Stephen. This land proved to be very profitable as the Bishops first mined the land in their own right and then they received money by leasing the rights to mine; the rights to which are still held by the Church Commissioners (Forbes 2000: 6).

6.1.3 Changes in Land holdings Post Reformation

The Post Medieval period saw immense changes within existing industries and the creation of new ones. The trend of expansion, growth and change seen in the wool industry in the Medieval period can be seen to have spread to other trades and industries (Pollard 2000; Braudel 2002). In the north east the extractive industries of lead and coal mining brought about technological and economic advancements as well as changes to society.

The change in the models of industry in the north east was in part due to the Dissolution of the monasteries and the resultant change in the ownership of land and its mineral rights. This brought with it a shift from a religious or pious imperative for the funding of the highways and transport networks to a secular one of market economics.

[127] King Stephen's nephew.

In the 125 years after 1530, land in England was bought and sold with a frequency and more abundantly than it had ever been before. This change of land ownership for the mineral rights to coal is clearly evident in the transferral in the leases for the collieries in the region. Before the Dissolution of the monasteries the Bishop of Durham had the title to all the minerals that were not within the lands belonging to free holders (Hill 1969: 64; Nef 1966: 134). Crown policy after 1529 was, however, one which aimed to reduce the power of the Bishops. In 1570s the Bishop lost control of the coal mining at Wickham, additional losses for the Bishops followed and in 1583 the "Grand Lease" changed the coal industry in the north east when the ownership of key collieries on Tyneside was transferred to the merchants of Newcastle from the Bishop of Durham (Nef 1966: 150; Hatcher 1993: 82; Clavering and Rounding 1995: 250). The resultant shift in the evolution of the transport system is manifest with the development of railed waggonways, to transport coal from the mines[128] (Nef 1966: 244).

An example of a coal owner's dedication to creating a transport system for the coal industry is that of George Dixon, who in the eighteenth century carried out experiments on Cockfield Fell in the Gaunless valley into the use of canals. One of these was a system whereby the coal would have been swept down the canal using a current of water. His ideas did not get past the experimental stage however, and aside from financial constraints the packhorses, roads and the more financially viable developing waggonway systems of the region already provided a network adequate for the needs of the burgeoning industry (Guy and Atkinson 2008: 139-140).

The mineral rights for the lead mining by contrast remained within the control of the Bishops of Durham. The early custom of the Bishops was to lease large areas of land rather than leasing a length or section of a vein. An example of an early mineral lease

[128] Waggonways, being classified as rail transport, are outside the remit of this PhD they will however, be considered and used as comparative examples throughout this chapter.

is that of 1380 when Alice Birkby was leased the whole area of the Weardale mines for a period of 50 years (Heyes 1997b: 107).

By the end of the 1600s it was more common to lease the rights to different minerals individually or in groups. In 1696 the rights to the lead ore in Weardale were granted to Blackett by the Bishop of Durham, this also included the rights to silver which was separated from the galena during smelting, whereas the rights to the other minerals such as fluorspar and iron carbonate were leased separately (Heyes 1997b: 107).

Despite the fact that the Bishops still owned the land the economic imperative for companies, such as that run by the Blacketts, to transport the ore and the lead was sufficient to create a specific transport network for the lead industry; a system of packhorse routes. The success of the packhorse routes also meant that the introduction of turnpikes into the area was late; the first turnpike in the 'ore field', the Hexham to Alston Turnpike was not established until 1778. The benefits of the packhorses were that over hilly terrain they were more efficient and faster than horse drawn waggons or carts. Work by Gerhold has also shown that packhorses could cover more distance per week, thereby allowing greater transport of goods and fulfilling the economic requirements of the lead trade (Linsley 1992: 71, 74; Gerhold 1993a: 14).

6.1.4 Lead Mining in the Seventeenth Century

By the mid 1600s the ore production on Weardale has been estimated to be ten times greater than that of the Medieval period and it was at this point that both the leases for mining and the technology for the mining changed, resulting in continued technological improvement, investment in and growth of the lead mining industry (Guy and Atkinson 2008: 6).

It was as part of the reorganisation of the leases that two powerful lead mining powers were created, the Blackett-Beaumonts and the London Lead Company. In 1684, the Blacketts, local owners of coal mining rights, were setting up lead mines in the Allendales (near to Hexham) on land that they had purchased. They then expanded their activities south, creating a large coherent area of lead rich land, by leasing the lead rights for Weardale from the Bishop of Durham in 1696. This astute acquisition of both land and mining rights meant that the Blackett-Beaumont family dominated the lead industry in Weardale for nearly two centuries (Heyes 1997b: 107; Forbes 2000: 6)

The London Lead Company started mining extensively in the Derwent Valley and Teesdale from 1696. The London Lead Company was created by the merger of two Quaker groups with mining interests. This gave the company a large capacity for smelting the lead ore and the economic stability to allow the company to test and pioneer new technologies such as the 'reverberatory smelting' process (North East History 2003: 1; Guy and Atkinson 2008: 6-7).

In other areas of the country leases were given for smaller areas and for shorter periods of time, this created a system whereby investment was highly speculative. In addition if lead was found it was only mined and processed in a basic and unsophisticated manner with no investment in new techniques or technologies. It was, therefore, in part the Bishop of Durham's continued interest in generating revenue from his land holdings in the Pennines that helped to create a stable and self-investing situation by two companies which were involved in the long term mining opportunities in County Durham (Guy and Atkinson 2008: 7).

6.1.5 The Washing Room Floor: Marginal Identities within the Workforce

The processes involved in lead mining changed the natural landscape, creating a cultural landscape where different techniques and developments were perceptible. An overview of the processing of the galena and the smelting follows in order that the production methods, the workforce and the material transported can be better understood.

Moderately pure lead sulphate is needed for the smelting process and so the minerals extracted from the mines had to be sorted to separate out the galena. This process was called ‘washing’ or ‘dressing’. The sorting worked on the principle that the heavier galena would become separated from the other excavated material, collectively known as ‘bouse’, when agitated in water. In the first step the extracted rock and ore were washed to remove mud and dirt then they were broken into smaller pieces using a hammer then these broken pieces were put into sieves to be shaken to separate the galena (Raistrick and Roberts 1984: 6; Forbes 2000: 24).

Before the use of water powered mechanisation the crushing and sorting was often carried out by women and children. At Killhope[129] the ore was crushed using water powered rollers and then sorted using mechanical jigs (large sieves) but, even though this mechanisation took away part of the physical labour, it still required intensive manual sorting and handling before and after crushing (Dunham 1992: 1).

The predominant professions of mining and jaggers were dominated by men. This is not to say that the work of women did not overlap into, or affect the lead mining industry. Women were, for example, employed within the lead mining industry but

[129] The Killhope mine (or Park level mine) is the site of the Killhope Lead mining museum and as such is well documented and researched. The area around Killhope is rich in earlier mines and smelting mills and so Killhope mine is taken as a primary regional example despite its greatest output being from the late 1700s onwards.

only above ground. They feature in later eighteenth century accounts and latterly in nineteenth century photographs at lead mines as sack makers and ore washers and dressers (Raistrick and Roberts 1984: 94, 188; Fletcher 1995).

Children too formed part of the labour intensive processing work force at lead mines, working on the washing room (or dressing) floors (Forbes *et al.* 2003: 49-50). The children who worked on the washing room floors were boys from the age of about nine, under which age they were thought not to be strong enough to be economically employed, to the age of 18. They and women undertook all the tasks in the extraction of the galena from the excavated materials, from the washing and the breaking up of the minerals to the sieving. These tasks often had to be stopped during the winter due to the snow and ice, the result being that the boys and/or women had to make up for lost time when the conditions allowed them to resume work. The working day of a washing floor boy or woman was therefore often much longer than the day of a miner (Forbes 2000: 26; Hunt 1970: 98).

Serious accidents were rare and there was a division of work over the washing room floor so that younger boys were given the lighter and less skilled work but overall the conditions were harsh. Work was outside in uncovered and unsheltered locations and the constant use of water meant that skin became raw and chapped. Working hours were long and often accompanied by a long walk to and from work using the lead routes (Hunt 1970: 97).

At the age of about 18 the boys would 'graduate' to work underground and a new group of boys would be employed on the floor to replace them (Heyes 1997a: 65). This distinction between the 'boys' and the 'men' adds an interesting dimension the idea of the identity of childhood, as, although the boys were working[130] they were

[130] which in some definitions 'childhood' would exempt them from being seen as children (Sofaer Derevenski 1994; Johnson 1999).

clearly seen as having an identity distinct from that of the miners and male workers who were over 18.

As discussed in chapter 2[131], within the lead ore extraction industry the two marginal aspects of the work force, the women and the boys, eventually came to be in competition for the same jobs. In the early eighteenth century women were commonly employed on the dressing floors. In 1828, however, the London Lead Company records describe replacing the women with boys. By 1842 only two women were listed as washers and the idea of women working on the washing room floors was thought to be 'very improper' despite it having been the very common less than 100 years before. At the end of the nineteenth century there were no listings of women on the washing room floors (Raistrick and Roberts 1984: 94; Hunt 1970: 98).

In a relatively short time therefore, it can be seen that women's identities within the lead mining community went from being formed through their experience of working as part of the industry to their identities being formed in part by the fact that it was thought to be improper work for women. This example of culturally constructed gender identity shows that whilst labour is often studied through class the examination of labour through gender inclusion and exclusion in the work place can provide an insight into the different identities within the same workforce (Voss 2006: 112; Silliman 2006; 150).

6.1.6 Smelting

Once the galena had been extracted from the mined ore the first stage in the transportation system began with the transfer of the sorted ore to the smelting mill. Smelting mills were widespread across the North Pennines and served different mines and were specific to the different companies, opening as they became associated with

[131] See section 2.4.

a new mine or additional output was required and closing as the accessible seams in the vicinity became exhausted (see appendix 2) (Forbes 2000: 36).

The basic principle of smelting is that heat is applied to the ore, allowing the separation of the lead, the silver and impurities[132]. An early form of smelter (later this developed into the furnace) was known as a ‘bale’, ‘bole’, ‘bole hill’ or ‘bail hill’. These were essentially stone hearths, designed to be open to the prevailing winds, the name coming from the bowl used to collect the lead before it was channelled to a cooling area where it was cast in a shape termed a ‘pig’ (Raistrick and Roberts 1984: 8). To produce a more consistent draught to maintain the heat of the smelter, foot bellows and bellows powered by water wheels were developed in the 1400s. These, although not extremely efficient, were simple to build and maintain and so they were used, in some areas, until the nineteenth century (Guy and Atkinson 2008: 33).

It was not until the late seventeenth century, however, that there was a dramatic increase in the number, scale and output of the mines in the region due in part to the advent of furnace smelting. From the 1650s the expanding industry and need for greater smelting capacity drove the development of two types of furnace, the indoor ore hearth and later the reverberatory furnace.

The ore hearth used water powered bellows to provide the air to the furnace, it also had the advantage of using peat as its main source of fuel, an advantage in Weardale where wood was scarce and coal had to be imported (Guy and Atkinson 2008: 33).

The reverberatory furnace was by contrast coal powered. Its development was in part in response to the shortage of wood and the restrictions on using large timbers for charcoal but it was also driven by the need for a method which could contend with the increasing output demanded of the lead industry. The draught was created using a

[132] For a chemical analysis of the smelting process see Russell and Wilmot 2000: 304

chimney, a departure from the other types of smelters and furnaces. Another significant difference with the reverberatory furnace, as opposed to the ore hearth was that the ore was not in direct contact with the fire, instead the heat was 'reverberated' or reflected onto the ore. Viscount Grandison obtained the patent for 'reverberated furnaces' in 1678 and in 1692 his works and holdings became part of the London Lead Company which promoted and developed their use and began using them in the Pennines in the 1740s (Raistrick and Jennings 1965: 116, 121; Guy and Atkinson 2008: 33).

The continuing economic and technological development of the lead industry was evident in the changing landscape as new mines opened and others closed. The appearance of the chimneys in the landscape indicated not only technological advancement but also denoted which company the mine belonged to, represented investment in the industry inferring prosperity and continued employment. These industrial landmarks provided the miners with a developing constructed environment and changing cultural landscape that the lead routes were both part of and provided access to.

6.2 The Transportation of the Lead

It has often been thought that water transport was the only major network serving the country's economic transport needs but for much of England this was not the case because not all inland rivers were navigable (in either depth, or access or due to obstruction by weirs and low bridges) (Hindle 1998a: 5). This is not to say that water transport by sea and river was unimportant, indeed most towns had access to a navigable river which would carry bulky and heavy materials and goods (Hindle 2001: 37). It was the overland network of routes spreading to and from these navigable rivers into the surrounding areas, however, that provided the next layer of communication. These over land routes played a pivotal part in the development of the nation's transport system, especially in areas without canals or navigable rivers such as the lead mining area of the North Pennines in County Durham where overland the over land network of pack horse routes were used to transport the lead to the Tyne.

From the smelting mill the cast smelted lead or pigs of lead were transferred in many stages to the docks for distribution. Newcastle was the main port used, not only by mines in the North Pennines but also by lead mines in Keswick, as it was so well developed when compared with Keswick's more local port of Workington (Hindle 1998b: 142). For the Killhope mine the smelting mill was at Allenheads to the north. Another important smelting mill for the area was at Rookhope further away to the east. This transportation of both the raw materials to the smelting mill and the finished product to the markets and docks of the region was, for the most part, carried out by teams of horses individually loaded with the freight and following established pannier ways (Blackburn 1992: 58-9). In Derbyshire there are records of carts being used to carry the finished lead to port but packhorses were still preferred as the most practical means for the carrying of the ore over the steep and hilly terrain (Hey 1980: 121).

6.2.1 Purpose, Rationale and Usage

There are many different terms for the tracks used by the packhorses such as pannier way, jagger lanes, carrier ways, all of which derived from different aspects of the trades for which they were used[133]. There is also an additional wealth of regional vocabulary associated with these tracks and carrier methods for example "pannier ways" is a term often used in North Yorkshire and Cleveland, referring to the panniers (the baskets or pouches) hung either side of the horse to transport the goods (Deane 1995: 31) whilst in Cornwall these panniers were known as 'peds' or 'pots' (Crofts 1967: 2). The panniers used for transporting the ore were long sacks or 'pokes' hung over a wooden bridge-like saddle (Blackburn 1992: 58). Figure 82 and

[133] Pannier ways were used extensively throughout the country for many purposes e.g. the salt trade, the chapman trade etc.

figure 83[134] show these saddles and the loading procedure. To transport the smelted lead the pigs were tied on to the sides of the saddle (see figure 84).

The average load of ore was 2 hundredweight (cwt), 100 kg or ¼ bing[135] this would be carried to the smelting mill usually in one stage. On the return journey from the smelting mill the horses carried other goods, often wood, back to the mine. The pigs of lead were approximately 1cwt each so the load for one horse was again 2cwt. The transportation of the lead to the ports and markets was done in relay stages. The load of lead would be dropped off at a strategic changeover point and the wood (and sometimes coal), that had been left there by the next team of horses taken back towards the mill (Durham County Council 1996). Figure 85 shows the horses loaded with wood which would have been burnt as part of the smelting process. It is assumed in most texts that the horses were loaded to their maximum capability on both the outward and return journeys so the load can therefore be thought of as isotropic, demonstrating the careful way that the most was made out of each animal and journey. These figures for the weights of the goods carried by the horses for the lead trade are directly comparable with those carried by the teams of packhorses in the Lake District. In the late 1700s teams of up to thirty horses went in and out the market centre of Kendal with supplies of wool going as far a field as Glasgow and London, each horse carrying up to 100kg (Hindle 1998b: 123).

6.2.2 The Horses

The term jagger lane comes from the generic name for a packhorse or a packhorse driver in the north of England. The horses are often referred to as Galloways, a specific breed from Scotland (now extinct) that was introduced in the seventeenth century and well known for their speed and stability over rugged terrain. By the

[134] Figures 82 to 85 are from a collection of original early nineteenth century sketches now held in the Science Museum's Science and Society Picture Library.

[135] The measurement of a 'bing' for ore was in common use until the end of the nineteenth century. The measurement was based on horse loads as follows: 2cwt or 16stone = 1 horse load and 4 horses = 1 bing. The 2cwt load was therefore ¼ of a bing (Blackburn 1992: 58).

eighteenth century these pure Galloways had been bred with local stock to become Dales ponies, which were also very strong (Kilmannan 2002: 1; Deane 1995: 31). In the Peak District it was noted by John Aikin in 1795 that lime was transported on the backs of Welsh horses but records of horse sales and fairs in Doncaster, Derby and Ashborne seem to suggest that it was local breeds and the 'gals' or Galloways that were most common (Hey 1980: 86-7).

The number of horses that would have been traversing the hill sides from smelting mill to port was large as the annual production of lead in the area was up to 1,500 tons per annum, equivalent to 15,000 horse loads or 3,750 bings. In addition 2,400 tons of ore was transported from mine to smelting mill this is equivalent to 24,000 horse loads or 6000 bings[136] (Blackburn 1992: 58). It has been estimated that at the larger mines up to 500 horses per day were using the routes. These horses would have been in trains of about 10-15 animals with a driver (a carrier or a jagger) and possibly a dog to ensure that the train kept moving. The horses were also muzzled to help maintain a steady speed by preventing them from grazing along the way (Deane 1995: 6).

6.2.3 Physical Characteristics and Maintenance

Some of these routes remain in the landscape today as paved tracks about two feet wide. In the Pennines it was common for these slabs to be gritstone whilst in North Yorkshire sandstone was more common (Philpin 1995: 1). These metalled routes are often associated with areas of difficult terrain such as a steep slope, marshy ground or awkward vegetation. The method of overcoming the steep slopes was to zigzag up to the high ground. A clear example of this can be found on the Stake Pass from Langdale to Borrowdale in the Lake District where recent reuse and investigation has led to the realisation that the zigzag section was actually engineered (Hindle 2001: 73).

[136] These figures give an ore to lead conversion of 62.5%

This engineering adds an interesting dimension to the network which, for the most part, is thought by people such as Muir 2006 to have been worn into the landscape by the sheer volume of packhorses and their carriers. In Weardale the Blackett-Beaumonts are known to have invested in the roads where lead in the late 1720s was being transported by carts. They carried out repairs, cleared roads and undertook additional engineering despite the fact that the roads were not their responsibility, as under the 1555 Highways Act the roads were the responsibility of the parish. The roads were of such importance, however, that the Blackett-Beaumonts could not, and did not, rely on that system of maintenance (Blackburn 1992: 61). Thus it is likely that it was the lead companies who also invested in the engineering and maintenance of the packhorse ways, as these too were a business imperative, long before the use of carts.

6.3 The People Who Used the Routes

Social and oral histories of the relatively modern past demonstrate that identities of considerable strength may be built up amongst workers and their extended communities involved in particular industries. This is particularly true amongst mining communities and much work exists on the modern sociology of coal-mining communities and their demise, for example Fisher 1981; Allsop and Calveley 2009. There are indications that strong community identity existed historically and amongst the lead-miners of the Pennines and amongst other forms of mining communities such as those associated with jet, ironstone, coal and tin.

Sustained historical occupation of the landscape may have contributed to these strong identities, as would shared exposure to and appreciation of the physical danger, plus an understanding of the routine physical tasks and skills required. Shared understanding of the way in which routeways traversed different landscape conditions, and how these should best be exploited seasonally may also have figured in the reproduction of occupationally-based identities. In this chapter, knowledge of and routine occupation of the landscape and how it should be traversed is explored to see if the lead routes were central to the reproduction of community and identity. In the cases of remote mines and lodging shops, see section 6.3.2, the use of the lead routes use of the routes almost entirely professional.

As discussed in chapter 2, section 2.3.3 and 2.4.4, it is the interaction with the landscape that is pivotal and as such roads can be seen as important to both the experiencing of and creation of place using works by Ingold (1993, 2000); Thomas (1993); Tilley (1994). The idea that a developing built environment can contribute to the idea of identity and the idea of social change is not a new one but has often been deployed when looking at Prehistoric landscapes (Barrett 1987; Thomas 1993; Fraser 2004) and so by looking at the ways in which the lead routes provided an experience of the world the criticism that archaeologists focus primarily on the labourers rather than the wider context that surrounded them (Silliman 2006: 150) is addressed.

Identities in the north east are complex and sometimes contentious[137] and the lead miners of the Pennines provide an example of strong regional identity based on locality, shared professions and experiences rather than ethnicity. The forging industrial districts and associated identities can be seen throughout the north east of England with strong identities created in the coal mining, ship building and lead mining (Milne 2007: 115-117). The mineral riches of the ore field brought people to the North Pennines and so the regional identity was based on the professional identity provided by the mines and associated work which had drawn people to the area rather than being a regional identity based purely on ethnicity (Linsley 1992: 71; Hunt 1970). This contrasts starkly against the Reivers[138] with their identities that were

[137] See chapter 2, section 2.4.3.
[138] See chapter 5, section 5.1.2.

based on a familial ethnicity which transcended any national identity (Keeling 1979: 24-5; Newton 2004: 170).

In the period covered by this thesis men, women and children were all employed within the lead mining industry. Bound in their identity as ‘mining communities’, transcending ethnicity, gender and age, when the mining in Allendale and Weardale declined in the 1850s and onwards, many miners and their families emigrated to countries such as the United States, Canada, Australia and New Zealand where mining work was available (Forbes 2002: 107).

6.3.1 The Jaggers

It is thought that the workforce involved in the transport of the ore and lead was an informal one. Hunt asserts that the jaggers or carriers *“lived outside the mining region proper”* (Hunt 1970: 109) and who were from farmland near the Pennines as the land within the mining region would not have been adequate for the horses to over winter (*ibid*: 109). Blackburn suggests that the workforce was drawn from the mining families within the Pennines and that the horses were hired from the large *“…hill population in possession of at least one Galloway…”* (Blackburn 1992: 59). Both Hunt and Blackburn concur that, in the period up to the end of the eighteenth century, the job of a carrier was as a source of additional income rather than as a full time profession.

It does not seem likely therefore that the jaggers’ use of the lead routes during the period when the role was not a profession helped to forge identities unique to that role. Their use of the routes may have, however, served to strengthen their identity as being part of the lead industry if they were from the immediate area or may have provided a link to that lead industry identity if they were from outside the mining region. Their place within this broader lead industry identity was tenuous from the perspective of those living along the routes as the locals did not always co-operate with the jaggers in regard to grazing for the horses and access rights (Hunt 1970: 110).

6.3.2 The Lead Industry Workers

The lead miners and the washing room floor workers used the packhorse routes to commute to work, often a journey of three or more miles to and from home each day. If the mine was remote the miners and the boys from the washing floor would stay in lodging shops, the conditions of which were often reported to be dreadful (Chambers 2002: 76). The development of new smelting works, as discussed in section 6.1.6, in particular would have been visible across the landscape from the mid 1700s onwards as the use of tall flues began. This changing taskscape provided a visual representation of the technological advancements within the industry, the investment of the lead mining companies and the continuing expansion of the industry of which they were a part.

The regular traversing of the landscape would have served not only to take the miners to work but also to provide the miners with a geographical overview of the landscape, under which they worked. The openness of the North Pennies contrasting with their daily work underground, giving an experienced representation of employment providing opportunity and constraint.

Their use of the routes also allowed them to be identified as mine workers to those who saw them as the distinctive ‘pillow bags’ (Raistrick and Roberts 1984: 172) in which they carried their provisions for the week marked them out as miners and mine workers.

In some industries such as the fishing industry along the North Sea coast the identity of the workers within the industry and indeed relating to their origin was communicated through clothing. Women from the fishing villages knitted ‘ganseys’, hard wearing, hand knitted jumpers which were seamless and made on small needles to produce a weatherproof garment. In addition to their obvious functionality the ganseys from the different home locations had unique patterns which, if a fisherman was lost at sea and washed to shore, could be used to identify his origin (Flamborough 2009).

There does not appear to have been a similar expression of communal identity and of gender division in the lead industry. The usual clothing for the miners was not particularly distinctive, comprising a cloth cap, jacket, waistcoat and long trousers. The addition of clogged boots and a walking stick were ubiquitous amongst the miners but not unknown amongst other trades (Raistrick and Roberts 1984: 188). The 'pillow bag' seems to have been the one unique item used by the lead workers. As for specifically crafted items by women for men, as the fishermen's ganseys were, there seems to be no comparable example extant. Workers in the smelting mills wore thick knitted shawls around their necks to protect themselves from the heat of the furnace and the draughts of the wind but it was common for the knitting to be done by men, women and children and there is no record of these scarves being stylistically distinctive in different areas. Indeed, especially in Yorkshire, the knitting of stockings by the whole family provided additional income for lead workers (Russell and Wilmot 2000: 306; Raistrick and Jennings 1965: 312).

6.3.3 Itinerant Traders

Pedlars and petty chapmen are known to have used the packhorse routes across the country in their quest to sell goods door to door, often in predominantly rural locations. Some even had their own pack animals to carry their goods (Spufford 1984: 18). This system for the purchase of goods such as cloth, ribbon and imported items such as tobacco was by the mid 1600s well established with the trade becoming the cause for comment and concern in the later seventeenth century as the trade became associated with unscrupulous 'rogues' (Spufford 1984: 7; Spicer 1611; Anonymous 1618 (?); Anonymous 1685; 1693; 1695; Cl 1731).

The pedlars, through their use of the packhorse routes, brought with them improvements in literacy as they sold 'cheap print', added a degree of comfort to the lives of many rural people by providing cloth and clothes and other 'domestic comforts' and provided information to rural communities as well. As such they were not only purveyors of goods but also cultural intermediaries bringing with them both spatial and cultural connectivity[139](Spufford 2000: 210, 217; 1984: 146). They therefore not only had their own distinct identity, created in part through the use of the lead routes but also impacted the identities of others.

6.4 The Routewayscape

There are both buried and extant remains of the lead industry routewayscape in County Durham. This includes both the remains of the routes themselves plus their associated features. Their survival is, in places, good due to the remote nature of the terrain that they crossed and yet their very remoteness has also resulted in the disuse and loss of the majority of the network. The survival and key routewayscape features, rather than those features associated with the lead industry itself, are considered hereunder.

6.4.1 The Survival of the Lead Packhorse Routeways

The survival of the more substantial packhorse tracks is reasonably good because the later turnpike roads took the easier routes along the valley bottoms. The packhorse routes which used the uplands, connecting many disparate industrial sites, avoided the lowland and so were not incorporated into the turnpike system or later used by other industries or modes of transport (Hindle 2001: 74). Not all of the tracks were paved;

[139] The ways in which the road and routeways helped to drive new aspirations and consumption, facilitated the exchange of information and fashions and helped to provide new sources of wealth will be explored in chapter 7.

some were just well trodden routes which often survive today as footpaths. A number of these survive in record alone, as routeways marked on 1st and 2nd edition OS maps and are often labelled as 'carrier ways'[140] (see figure 5). Yet more are not even recorded in such a way, but for these landscape features, place names and aerial photographs give a clue to their routes. For example the aerial photograph for Low Allers (figure 4) shows potential track ways which may link Weardale mines to the smelting mill at Rookhope[141].

The re-use of the packhorse routes as footpaths and as part of industry themed 'heritage' walks has become increasingly popular. For example Durham County Council produces two packs, the 'Lead Mining Trail' and the 'Lead Mining Landscapes' which detail walks in the Pennines using, in parts, the packhorse routes. They also provide information about the industry, indicate and discuss industrial sites along the routes and give details of the lead mining museums and centres in the county. This combination of leisure and education serves to maintain the survival of both the routes themselves and an appreciation of the people who used them and what they were used for (Durham County Council 1996; 2002).

6.4.2 Saddle Houses and Bridges

There are numerous features in the landscape which point to the origin of an existing route or now obsolete routes. These include 'saddle houses' the places where the animals' packs and rigid wood frame saddles were stored over night, an example of which can be found in Egglesburn (see figure 86). The wooden saddles from the Egglesburn saddle house were taken to the Bowes Museum in the 1950s (Beadle 1992: 29).

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[140] For clarity within this thesis the use of the term 'carrier' has been restricted to that referring to the time tabled services for the transport of goods by waggon and packhorse discussed in chapter 4.
[141] See chapter 3, section 3.3.

Packhorse bridges are often seen as a key indicator of the routes as they are often distinctive in style. The 'classic' packhorse bridge is narrow, (less than 2m wide and therefore narrower than a cart or waggon), with a humped single arch span and with low parapets to enable the horses' panniers to pass freely[142]. They often cross fordable streams but as the horses were heavily laden, with valuable goods, these small bridges were built often at the peak of the industrial trade, the river also retaining its ford crossing (Hindle 2001: 70; Harrison 2004: 68).

Regional examples of packhorse bridges survive at Egton in the North Yorkshire moors and Thorsgill near Rokerby (Close 1927: 6). In County Durham there are six packhorse bridges recorded in the HER (see appendix 2), all of which are narrow, single span arches.

6.4.3 Place Names and Pubs

Place names derived from words associated with the packhorse ways are many and varied. The word stoop (also stob, stump and stub) was used to describe guide posts on the pannier ways; stoop and its derivatives are seen on maps as highstoop, stobhill, and stumpcross. Jagger appears as jaggerlane and jagger hill. Gate, from the Norse '*gata*' meaning road or track, can be clearly associated with the lead mines because leadgate is common throughout the county; in Wolsingham a variation of this is seen with the spelling Lydgate. Many other examples exist, some being peculiar to a region where a word evolved or took on a different meaning (Deane 1995: 31-2; Room 1992: 88).

The names of public houses such as 'The Pack Horse' on the A693 from Leadgate[143] to Gateshead can also help to connect the routes. A Pack Horse Inn can also be found in Stanhope, with the pub sign showing a horse with panniers. Other names that allude to the packhorses and their goods include 'String of Horses', 'Bay Horse', an

[142] A more detailed review of packhorse bridge types can be found in Thornber 2002: 9-21
[143] The place name Leadgate itself, self evidently, referring to a lead route.

example in Wolsingham, 'The Carrier' and in areas where textiles were transported 'The Woolpack' or 'The Fleece' as at Castleside (Hindle 1998b: 123; Dunkling and Wright 1994: 93).

6.5 The Decline: Turnpikes, Waggonways and the Railways

The decline of the packhorse ways was gradual. Roads throughout the region were improved following the introduction of turnpikes from the early eighteenth century. This improvement in the road network came at a time when mine owners (both lead and coal) were increasingly interested in maintaining and developing the road network to increase their own efficiency and profits.

The coal industry, from the 1600s, was also investing in the development of waggonway systems. The earliest waggonway in the county is thought to have been in use before the 1630s with the first waggonways in the country having been constructed in 1604 in Nottinghamshire and circa 1605 in Shropshire. These were wooden railed routes along which a horse would pull a waggon containing up to two tons of coal. A waggonman accompanied the horse to control the speed. These were not planned as a unified system and the gauge of track and the methods for their creation differed across the county (Dockerty 2009). In stark contrast to the Roman roads the waggonway routes were influenced not only by distance and slope but also the legal restriction that permission to cross land in the form of a 'wayleave' was required. In certain cases the landowners prevented development, either in the hope that more money would be tendered or because they had allegiances with other mining companies.

Causey Arch in County Durham, which was built in 1725-6, lays claim to being the oldest railway bridge in the world[144] and marks the beginnings of a more planned system as, by the eighteenth century, the coal trade in the north east was controlled by

[144] Although a waggonway culvert at Horton Bridge may be the 'earliest stone structure built to carry a waggonway' (Fleming 1976: 19)

a partnership of wealthy coal owning families called the 'Grand Allies'. These included the Russells of Brancepeth[145], the Liddells of Ravensworth, the Brandlings of Gosforth and the Bowes family[146]. This group funded additions to the waggonway network for mutual gain. The Great Northern Coalfield therefore accounted for half of all the waggonway miles in Britain, negating the creation of canals (Mann 1984: 221-4, Oldroyd 1996:1, Ellis 1998: 141; Guy and Atkinson 2008: 163).

Within the lead industry the transport imperative was so great towards the end of the eighteenth century that companies went so far as to develop and test suitable wheeled carts to try to improve transport efficiency and it is estimated that the Blackett-Beaumonts spent more on transport than on smelting (Blackburn 1992: 59; Linsley 1992: 71). Waggonways were, however, not a viable solution as the terrain of the Pennines was to mountainous and the lengths of waggonway required would have been too long to be economic due to the engineering costs, maintenance requirements and the distances that the horses pulling the loaded waggons could cover effectively[147]; therefore packhorses continued to be used alongside the improving roads (Guy and Atkinson 2008: 163).

Over time the use of carts on these improving roads increased as the prosperity of the mines slowly decreased. From the mid 1800s the lead mines struggled to compete with cheap continental imports and the mining became harder and more costly as deeper and deeper seams were exploited. There were peaks and troughs in production and profit but the 1880s saw both the Blackett-Beaumonts and the London Lead Company leaving Weardale (Guy and Atkinson 2008: 8).

The arrival of the railways to this area of the county in the 1850s and 60s marked the debut of the terminal decline for the lead industry. Its decline during this period is

[145] William Russell was by 1796 the country's richest 'commoner'.
[146] Some of the properties of the Bowes family form part of chapter 7.
[147] A length of 10 miles was for the most part seen to be a maximum length for expedient transport at an acceptable cost (Guy and Atkinson 2008: 163).

reflected in the fact that proposed lines to once busy mills were never built, however, the use of the horses on the shorter lead routes never stopped however, a testament to their suitability for the arduous job over difficult terrain (Linsley 1992: 78).

6.6 GIS and Graphical Analysis

6.6.1 Aims of the GIS Analysis

As with the Roman roads and the drove routes the aim of the GIS analysis is to explore and determine the key motivators and priorities in the creation and placement of the lead routes. The lead routes present a route type which like the drove routes were created for a distinct economic purpose but were also traversed by both people and animals. The terrain that a horse can cross is different to what would be passable by cattle and so slope is investigated to see if this difference of users created a distinctive route type. The land use type crossed is studied using the modification of the costs of crossing different land use types to explore the hypothesis that the routes deliberately used marginal land.

6.6.2 Issues Pertinent to the Lead Routes

A wide range of resources were used to plot the lead routes[148]. The lead routes that could be plotted accurately had been used extensively and for prolonged periods of time were selected for the GIS analysis. For these reasons possible routes such as that seen in the aerial photograph, figure 4, were not included[149].

The start points of all the routes used are within County Durham. Routes 1, 2, 3, 4, and 5 have arbitrary end points at their exit from the county. Routes 6 and 7 have their start and end points within the county.

[148] See chapter 3, section 3.2.2.
[149] See chapter 3, section 3.3.4.

Scale is again a pertinent issue, unlike the majority of the Roman roads and the drove routes the lead routes do not cut across the whole of County Durham and are shorter and so the idea that the lead routes did not produce the normal distribution histograms as seen for the Roman road and drove routes because the normality was reduced by stochastic variation[150] is discussed in section 6.7.9.

6.7 Plots Derived from Slope and Elevation Data for Lead Routes 1 to 7

The graphs for the lead routes 1 to 7 are figures 88 to 110 inclusive and are located in section 12.5.1 of volume 2.

6.7.1 How to Read the Graphs

Please refer to chapter 4, section 4.5.1. As with chapters 4 and 5 commentaries are provided for graphs of interest.

The lead routes (see figure 87) were isotropic[151], used in each direction, each graph can therefore also be considered in reverse for the reverse of the route, that is, a slope down one way will be a slope up in the other direction. The written descriptions are from the journey depicted in the graphs in the directions indicated in the introduction for each route. As the routes were used in each direction the histogram for lead route 4 has also been plotted to demonstrate the absolute values of a round trip on that route.

[150] Stochastic implies the presence of a random or unknowable variable (OED 2010).
[151] See chapter 3, sections 3.1.2 and 3.2.4.

6.7.2 Lead Route 1

Lead route one, as depicted in the graph, runs north east from Cowshill to Rookhope then heads north north east past Townfield before exiting County Durham.

Slope in Degrees Against Point Number (50m intervals) (figure 89)

The slope for this route is spread, for the most part, between -10 degrees and 10 degrees.

Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 90)

The histogram shows this spread of results with high frequencies in a broad range of the change in elevation groupings from -5m to 2m.

6.7.3 Lead Route 2

Lead route 2, as depicted in the graph, starts near Killhope and heads north east out of County Durham.

Elevation Against Distance (figure 91)

Lead route 2 is a short up hill route, running for only a short distance within County Durham.

Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 93)

The histogram clearly shows that there is no negative change in elevation in this direction. The mode is 5m. With the 0m, 4m and 8m bins also having high frequencies.

6.7.4 Lead Route 3

Lead route 3, as depicted in the graph, starts between Killhope and Cornriggs and heads north east out of County Durham

Elevation Against Distance (figure 94)

The graph for lead route three shows that there is an ascent followed by a descent and a final ascent. As with lead route 2 its distance within County Durham is short.

Slope in Degrees Against Point Number (50m intervals) (figure 95)

The results for the slope are spread between -4 degrees and 8 degrees with high frequencies of results between -2 degrees and 0 degrees plus 6 degrees to 8 degrees.

6.7.5 Lead Route 4

Lead route 4, as depicted in the graph, begins south of Cowhill, passes to the east of Cornriggs and heads out of County Durham at the same point as lead route 5.

Slope in Degrees Against Point Number (50m intervals) (figure 98)

The spread of the slope is predominantly in the positive between 0 degrees and 8 degrees.

Histogram for Change in Elevation (m) Between Points at 50m Intervals (figure 99)

The spread of the results is broad and the mode is 4m.

Histogram for Change in Elevation (m) Between Points at 50m Intervals Using the Absolute Values (figure 100)

This graph assumes a journey experienced in both directions with the mode again being 4.

6.7.6 Lead Route 5

Lead route 5, as depicted in the graph, starts near Wearhead and heads north east before changing, gradually to a north north westerly heading out of County Durham at the same point as lead route 4.

Elevation Against Distance (figure 101)

The graph shows that lead route 5 ascends, then continues along a section of moderately even terrain, with a small descent, before climbing to reach 598m.

Slope in Degrees Against Point Number (50m intervals) (figure 102)

This graph shows that there is a wide spread in the degrees of slope along this route. The majority of the results are in the positive with the maximum being 12 degrees and the minimum being -5 degrees.

6.7.7 Lead Route 6

Lead route 6, as depicted in the graph, heads north east to Ireshopeburn.

Slope in Degrees Against Point Number (50m intervals) (figure 105)

The spread of the slope is, for the most part, between -2 degrees and -6 degrees. A maximum of -15 degrees occurs but is not part of the general spread.

6.7.8 Lead Route 7

Lead route 7, as depicted in the graph, branches from lead route 1 at a point north of Rookhope and heads north east to Edmundbyers.

Slope in Degrees Against Point Number (50m intervals) (figure 108)

The majority of the points are between -4 degrees and 0 degrees. There is one result which stands out from the overall spread being 8 degrees.

6.7.9 Conclusion

The routes are what would be expected for packhorse routes. Unlike the Roman roads and the drove routes which have high results in the -1m, 0m and 1m bins in the change of elevation histograms, the changes in elevation of the lead routes are spread, with very little if any conformity to a normal distribution curve, but with no extreme outliers in either the slope in degrees of the changes in elevation. The terrain is in parts steep and hilly and yet the change in elevations is kept within the tolerances of +/- 15 degrees compared to the slope of some of the Roman roads reaching -23 degrees. These figures are within the tolerances of the pack animals and so it can be seen that whilst a moderate slope of -2 to +2 degrees is not required the amount of slope is determined by the predominant traffic of laden packhorses that used the routes.

By virtue of the fact that this thesis compares very different route types the notion that this could be a cause of the patterning in the results must be appraised. The idea that the lead routes did not produce the normal distribution histograms because the normality was reduced by stochastic variation was explored by combining the change in elevation results for all of the lead routes to create a histogram for a longer route over the landscape experienced by the lead routes, see figure 110. This shows that even based on a longer route, giving a larger sample size, a normal distribution is not present as the spread is wide, the mode however is 0. Looking at the absolute results the mode is 1 and again the broad spread is visible.

The slope for the drove routes was also, for the most part, between -15 degrees and +15 degrees, supporting the conclusion that this range is suitable for animals. The outliers for the drove routes are however much more substantial compared to the lead routes as the drovers routes were able to vary their routes to avoid such obstacles. The lack of such outliers for the packhorse routes indicates the more rigid course of the lead routes due to the economic and practical restrictions on which land types could be crossed, which will be analysed later in section 6.9.

6.8 Plots Derived from Slope and Elevation Data for Least Cost Routes for Lead Routes 1 to 7

The least cost routes have the same start and finish points as their corresponding lead route. The least cost routes can be seen in figure 87. The graphs for the least cost paths for the lead routes are figures 111 to 131 inclusive, located in section 12.5.2 of volume 2. Selected commentaries are provided hereunder.

6.8.1 Lead Route 1: Least Cost Route

Elevation Against Distance (figure 111)

The profile for the least cost route differs substantially from the actual route. The least cost route has an initial ascent, and then maintains a fairly even course followed by a descent. The route is 2560m longer, representing a 14% increase in length.

6.8.2 Lead Route 2: Least Cost Route

Elevation Against Distance (figure 114)

The least cost route is, in profile, visually very similar to the actual route. The least cost route is only 1m longer.

Histogram for Change in Elevation (m) Between Points a 50m Intervals (figure 116)

The subtle difference between the least cost route and the actual route is evidenced in the histogram. Here it is clear that there is a higher frequency in the 0m bin, it being the mode. In addition the 9m, 10m 11m and the 12m bins have a higher frequency of points.

6.8.3 Lead Route 3: Least Cost Route

Elevation Against Distance (figure 117)

The least cost route has a small descent before a long ascent, peaking at 585m before descending again. This route is 148m or 9% longer than the actual route.

6.8.4 Lead Route 4: Least Cost Route

Elevation Against Distance (figure 120)

The least cost route descends and continues along a plateaux then climbs to the end point. This route is 4% longer than the actual route.

6.8.5 Lead Route 5: Least Cost Route

Elevation Against Distance (figure 123)

Whereas the actual route covered more even terrain after a climb the least cost route makes only a short ascent and then has a section of plateau before continuing the climb. This route is 15% shorter than the actual route.

6.8.6 Lead Route 6: Least Cost Route

Elevation Against Distance (figure 126)

The least cost route is only 2m longer than the actual route and the profile is similar in that it is a downward slope into the valley, determined by the topography,

6.8.7 Lead Route 7: Least Cost Route

Elevation Against Distance (figure 129)

The least cost route is 1200m longer than the actual route making it 12% longer

6.8.8 Conclusion

It is clear from the least cost routes such as those for lead routes 1 and 2 that the emphasis is upon maintaining small changes in elevation, even if that entails some sections of the route having large changes in elevation. When dealing with pack animals this option of “short term pain for long term gain” is not feasible as the routes have to remain within the animals abilities at all times, even if that means that the route has, overall, more changes in elevation albeit incrementally smaller.

Unlike the Roman roads and the drove routes the length of the least cost routes is not always greater. For example, the least cost route for lead route 5 is 15% shorter than the actual route. This would seem to indicate that the distance for the lead routes was not as important as other factors such as slope and land use type crossed. For the longest route, and therefore most comparable to the Roman roads and drove route, the additional distance for the least cost route is 14%. Taking into consideration that the least cost drove route with the lowest increase in distance still saw an increase of 38% it is possible that the fact that the lead routes are shorter has resulted in least cost routes of more similar lengths to the actual routes.

Again the fact that it is very different routes that are being compared needs to be acknowledged. Looking once more at table 3, however, where the sections of the Roman road 5 were analysed it is clear that a short route does not necessarily create a short least cost route, for example the section on Roman road 5 from Bishop Middleham to Sedgefield was 2,862m long and the least cost section was 94% longer. Lead route 6 was 2,859m long and the least cost route was 0.2% longer. The results for the length of the least cost routes do not therefore seem to be affected by the length of the route.

Another determining feature to be noted is the landscape over which the routes were travelling; the topography of the locations of the lead routes is one of steep hills and valleys. In a steeper landscape the least cost paths have fewer options for alternative routes; this is especially true with unweighted surfaces[152]. The greater scope of the landscape crossed by the Roman roads and drove routes gives the least cost path a greater opportunity to extend its length to save on slope based cost.

In conclusion for the lead routes the need to remain within the animals abilities to cover the slope at all times can be seen to be a determining factor above distance.

[152] See chapter 4, section 4.7.2

6.9 Land Use Types as Potential Determining Factors for the Placement of the Lead Routes

Another criterion which is likely to have been influential in the placement of the routes is that of land types crossed. Two aspects of this would have come to the fore, ease of traversing the land and its usage. These aspects will be investigated hereunder.

One of the limitations, as previously discussed[153], of the research into the types of land use crossed by the lead routes and their least cost paths is that the land use data is modern day. It was decided that for the purposes of this broad scale study that this modern data set would provide adequate information because it is unlikely that the predominant land type for the lead mining areas of County Durham, moorland, will have changed.

The land use types crossed by the lead routes and their least cost paths were calculated by using the map calculator functionality of the GIS[154]. The area and the percentage areas of both the roads (and least cost routes) themselves and County Durham were calculated and the results can be seen in see table 5. In graphical form the results for the lead routes can be seen in figure 132 and for the least cost routes figure 133. As with the drove routes, to provide a clear overview, the number of land use categories was then reduced by generalisation and the percentage areas stacked by route in figure 134.

Figure 132 shows that the predominant land type crossed by the routes was that of moorland[155]. Land types suitable for the grazing of animals, as with the drove routes, such as rough grazing and grassy moorland also feature highly. The only farm land that the routes cross is pasture, which is again suitable for grazing and to which the animals would do the least damage.

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[153] See chapter 5, section 5.8
[154] For more details see chapter 5, section 5.8
[155] Comprising moorland grass, moorland grass/heath, moorland heath and moorland blanket bog.

For many types of roads and routeways the land type crossed plays a role in the selection of the route. This may be due to, for example, land ownership or the need to preserve suitable areas for farming. In the Pennines, the small and fluctuating wages of the miners meant that they were often 'miner-farmers', using subsistence small holdings to supplement their wages. Some of the farm holdings are the highest above sea level in the country, on the very edge of viability (Forbes 2000: 39) but as discussed in Turner and Young (2007) *"In difficult places, people can change their strategies, and the land might hold very different potential…"* (Turner and Young 2007: 300). Thus whilst the percentage of farmland is low in the area, as well as being farmed as small holdings rather than extensively and so statistically less likely to have been crossed by the lead routes, it was highly valued, and so it would have been avoided where ever possible, the lead routes often taking a course along liminal land, in between cultivated land and moorland (see figure 135).

The results of the least cost routes highlight another consideration of the land type crossed; that of practicality. For the least cost route of lead route 1 the percentage of the route going over blanket bog is 49%, compared to 7% for the actual route. The practical and potential engineering considerations for enabling trains of horses to cover extensive areas of blanket bog would mean that the physical and monetary costs would be greater than taking an alternate route with a greater slope.

To investigate the issues of avoidance of agricultural land and blanket bog additional costs, at an additional 10% to the underlying slope cost, were added to the least cost grid for blanket bog and pasture farmland[156]. The resultant least cost routes for lead route 1 can be seen in figure 136.

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[156] For details of the map calculation methodology see chapter 3, section 3.2.3: Data Processing for the Least Cost Paths and Viewsheds.

The initial least cost route can be seen to cover a large proportion of modified blanket bog (49%). The map calculator function of the GIS was used to add a higher cost value for selected land use types and when this land type was weighted to include a cost in addition to the slope the result was that the route followed the valley floor, crossing a large amount of pasture farmland. Having established that in addition to the practical concerns of navigating over bog that farmland was of prime importance this route would not have been feasible. The pasture farmland was then given additional cost, again at a 10% increase to the underlying slope costs, and the resultant least cost path, which closely follows the actual route, would therefore seem to indicate that these two land use factors, in addition to the consideration of a slope suitable for the train of horses, would have been influential in the creation of the lead routes.

6.9.1 Conclusion

Land type, land use and slope were all influential in the creation of the packhorse routes in County Durham. As observed earlier the lack of such outliers in the change of elevation and slope plots for the packhorse routes indicates the more rigid course that the lead routes had to take due to restrictions placed upon them, not only by slope but also on which land types could be traversed. These restrictions have been shown to be farmland, needed for the survival of the miners and land which would have required large amounts of engineering and maintenance such as peat bog.

The unique liminal placement of the lead routes in relation to the patterns of upland agriculture, allowed the transportation of goods, on a low maintenance route without impacting on agricultural needs. It also demonstrates the duality of the professions of those living in the ore fields of County Durham, whereby the routeways and the farming were required to co-exist, the farmland by necessity having precedence.

6.10 Chapter Conclusion

The packhorse routes had an important role in modifying the landscape. They were the backbone of the economy, built on the lead industry, they provided routes by which the workers got to and from work and they were additionally used by itinerant traders bringing goods and news into the area.

The course of the routes was influenced most greatly by the economic use, which created a range of factors that needed to be observed if the system were to provide a cost efficient and speedy solution to the transportation of the lead. The routes had to be comprised of slopes suitable for the heavily laden pack animals, with no excessive distances, in addition the land over which they carried the lead and its ore had to have no disproportionate requirement for engineering or maintenance works which would impact on the profitability and indeed the viability of the lead industry itself. The economic considerations of the companies also encompassed the miners' need to supplement their wages from mining with subsistence farming, thus the lead routes avoided, where ever possible, the land suitable for agriculture. After all, without miners there would be no lead to transport.

The statement that: *" The high profile of this form of transport* [packhorse routes] *in the region until little more than a century ago was testimony to the severe inadequacies of the land transport network…"* (Muir 2006: 193) makes the assumption that these packhorse routes were only used as a second best, second choice over 'proper roads'. It could be argued, however, that the imperative for change to County Durham's transport network was not a regional imperative until later than other areas[157] due to the packhorse routes suitability for the landscape of the north east region and because they worked in combination with other transport network types.

[157] For example the late arrival of the turnpikes into County Durham in 1740 and the even later advent of the turnpikes of the ore field in 1778.

The fact that the lead companies, such as the Blackett-Beaumonts in Weardale who are known to have invested in the roads (in addition to the packhorse routes) meant that the roads and the packhorse routes became an integrated system with the ore being transported by packhorse and the lead by cart in mid 1700s. The packhorse routes therefore provided an infrastructure that served the developing road system. The lead routes not only co-existed with the drovers' routes and the re-used Roman roads but formed part of an holistic network which, through using different network types for different tasks and purposes, gave a coherent and integrated transport system across County Durham.

Just as the Roman roads provided connectivity to the Roman empire[158] and the drove routes provided connectivity between rural areas and London[159] the lead routes created access routes for itinerant traders to bring consumer goods and information into the area, an additional benefit to their primary economic function.

Some work on architectural styles in the Pennines has been done for example: Crosby 2002; Forbes *et al.* 2003 but more research into the built taskscapes experienced by those who used the lead routes, specifically into settlement, communities and architecture associated with the lead industry are needed in order to be able to look at the effects of the infiltration of connectivity created by the lead routes alone in the Pennines. To date the focus of research into the industry of County Durham is predominantly focused on industrial process itself rather than those who worked in the industry.

The exploration of identity as experienced from the use of roads and routeways in this chapter has drawn together the idea of the taskscape, employment, identity and gender, showing that those engaged in the lead mining industry and the use of the routes were not just the obvious males with the role of miner but also children and

[158] See chapter 4, section 4.8.
[159] See chapter 5, section 5.2.1

women, creating a collectively strong regional identity based on profession rather than ethnicity. Therefore, whilst the drove routes were 'gendered', the power dynamics between age, gender and profession for the lead routes show that the cultural landscape and experience of the landscape was one bound predominantly by occupation.

"One's destination is never a place, but rather a new way of looking at things.."

(Miller 1957: 25)

7 Roads, Routeways; Architecture and Lifestyles

Chapters 4, 5 and 6 have shown the causes and effects of road and transport network development in County Durham in the period from 1530 to 1730 and have analysed the commonly made assertion that routes changed little from the Medieval period until the Industrial Revolution. The concept of cultural landscapes has been applied to support both the functional and the emotive aspects experienced by the people, such as the drovers and the lead industry workers, using the roads and routes which cross the landscape. The idea of the 'being in the world' experience and taskscapes have been used to show the powered dynamics that these people brought to and created in terms of the road and routewayscape, which they exploited.

In this chapter the different networks of roads and routeways traversing County Durham, such as the re-used Roman roads, drove routes and the lead routes will be viewed holistically, rather than as discreet networks. These networks brought with them the concept of national and international 'connectivity', and will be shown to have allowed a changing social elite, the gentry and the rising 'middle-classes', to become more nationally unified in their respective aspirations, fashions and architectural ideals.

This thesis argues that roads and routeways were also the conduits for the dissemination of cultural ideas and directly affected aspects of consumption as they facilitated the movement of people, ideas and goods. The roads and routeways brought with them the new concepts of national and international 'connectivity', allowing a changing social elite, the gentry and the rising 'middle-classes', to become more nationally unified in their aspirations, fashions and architectural ideals. The vernacular classes too, had the opportunity to 'buy into' elements of architectural styles and new patterns of consumption, thereby demonstrating the extent to which the roads affected every level of society. This has been seen for example with the re-used roman roads becoming part of the postal network, the drovers carrying information gleaned from their journeys to London and the lead routes forming a network which was used by itinerant traders to gain access to more remote areas.

In order to strengthen this argument, architecture has been chosen as a suitable example as it provided a means of creating and displaying class consciousness and this chapter, will examine the broadscale effects of these roads and routeways in the north east region, brought to the immediacy and intimacy of the home environment. It will consider examples of vernacular and gentry architecture and put forward the hypothesis that, in addition to explanations for change, well rehearsed by, for example Johnson (1996), the improved network of roads and carriers also contributed to these transformations.

The impacts of the travel, movement and economic growth that the roads facilitated will therefore be explored in this chapter and will be used to assess the questions highlighted in chapter 1 as being research priorities in the NERRF. The questions: *"Did these lead to the creation of a distinct suite of material culture, architecture or patterns of consumption?"* and, *"Does the Post Medieval period see a rise in class consciousness?"* (Petts and Gerrard 2006: 182) will be investigated in relation to the ways in which the road and routeways helped to drive new aspirations and some aspects of the patterns of consumption, facilitated the exchange of information and fashions and helped to provide new sources of wealth.

In this chapter the social identity of individuals and communities is examined as an aspect of class consciousness. Thus the roads and routeways will be shown to be an integral part to aspects of the rise of class consciousness and also the ways in which these emerging groups physically displayed their wealth and desires. The ways in which these changes were expressed architecturally, are approached using three regional and varied architectural examples, thus addressing the question, *"How is this reflected in archaeology and architecture?"* (Petts and Gerrard 2006: 182).

7.1 Bringing it all Home: The Effects of the Road and Routeway Network on Vernacular and Gentry Architecture and Lifestyles

Towards the end of the seventeenth century travel in England and throughout Europe was becoming easier with a more settled political climate and improving infrastructures. This travelling brought about an increasing awareness of national and international styles, and re-enforced the ideas of nationhood. 'Grand Tours'[160] of Europe became popular and the resulting influences can be seen in inventories and architecture throughout County Durham. This breaking down of the barrier of distance meant a decrease in the architectural isolation of smaller towns distant from London such as Newcastle leading to an increasing uniformity throughout the country, whereby Fiennes during a tour of England c.1698, was able to comment that, "*…it most resembles London…*" (Fiennes 1888[161]: 176; Bohls and Duncan 2005: 3; (Brayshay *et al.* 1998: 265).

Travel and travel writing were becoming more common as the literary market and appetite for travellers' tales increased and encouraged different styles of writing covering many varied locations from Europe, the Caribbean, the Americas and Australia (Bohls and Duncan 2005: 3). In Britain, Daniel Defoe (c.1660- 1731) and Cecilia Fiennes (1662-1741) are perhaps the two best known travel writers, but whilst they both travelled and wrote they did so for very different reasons.

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[160] A term created by Lassels in his work "The Voyage of Italy" (Bohls and Duncan 2005: 3).
[161] The 1888 publication of her work was used for this thesis.

Defoe was a *"…journalist, novelist, entrepreneur and sometimes spy…"* (Bohls and Duncan 2005: xv) and who is credited as founding 'economic tourism', focusing on trade and industry being a driving force for future change (Defoe 1971; Bohls and Duncan 2005: 96). Fiennes by contrast wrote memoirs that were intended for her family, not a wider audience. She too focused on the trades and manufacturing industries of the places she visited, some two decades before Defoe, signalling that trade and the movement of goods and people across the country was an increasing area of interest and part of the national experience (Fiennes 1888: ix-x).

Increasing wealth in certain sectors of the social hierarchy, such as the gentry, increased consumption of commodities and influenced architectural styles. In Durham in the early 1700s examples of niceties such as metal work and fine plasterwork became more numerous as did the application of a Georgian[162] façade to an earlier building or buildings. The demolition and complete rebuilding of a property was usually unfeasible due to cost and so re-fronting was both a practical and an economic solution to the problem. The public side of the house was altered whilst the private areas were left largely unchanged. The front was then *"… an unavoidable advertisement as to how an owner or occupier wished to be perceived in local society…"* (Borsay 2000: 99).

These architectural changes were imbued with social meaning. Those employing the architectural techniques were deliberately publicising their education, their travel, their wealth and, as rich, educated people, their understanding of the subtle classical roots of the style that they had chosen. Classicism, *per se*, was seen as a way of symbolising social excellence as it was seen to imply great knowledge of classical culture and architecture. The placing of a Georgian façade on an existing earlier structure is not; however, the same as building a new beautiful Palladian house in its own landscape setting. It has therefore been argued that the gentry and the middle

[162] A form of architecture encompassing many classical themes of order and symmetry (Johnson 1996: 16).

classes were merely emulating the upper echelons of society without understanding the *"…complex allusions…"* (Johnson 1996: 152-3). It is equally likely, however, that it was a time when the gentry could afford to embrace a new architectural style, albeit only in part. So they did, out of choice and understanding, not through mere imitation; rather than doing nothing.

Whilst travel, improving postal and carrier services and roads did create connections to London and beyond, the majority of people would not have, themselves, travelled to a large city such as London or York. It was therefore the transfer and travel of information, within and without the study area, along the re-used Roman roads rather than physical journeys that influenced the lives of most people. The impact of the difference in the time it took for information to reach different parts of the country is one that, to a lesser extent, is still experienced today where terms such as "out in the sticks", "back of beyond" and even "North of Watford Gap" are used to describe rural areas and denote parochialism and isolation. A time delay in the following of fashions[163] is the most notable evidence for this time difference. In Austen's novel 'Pride and Prejudice' both the delay in the transmission of information and the means by which travel by a few facilitated its dissemination are demonstrated by Mrs Bennett, remarking to her sister in law visiting from London *"…and I am very glad to hear what you tell us of long sleeves."* (Austen 2004: 108).

Although most people in the period from 1530-1730 would not have travelled, roads facilitated the expansion and broadening of their understanding of the geography, resources and fashions of the country, Europe and indeed the world (Brayshay *et al.* 1998: 284). In the mid seventeenth century foreign trade with Europe had become widespread and was becoming increasingly organised and integrated. Exotic goods such as tobacco, sugar, silk and spices were also beginning to be moved with increasing efficiency (Riley 1999: 252), A common form of trading in the sixteenth and early seventeenth centuries was the 'travelling salesman', or peddler, sometimes

[163] For example in architecture, clothing and consumer products.

generally termed ‘chapmen’ who specialised in selling cloth, books, haberdashery items and occasionally spices. These chapmen, as with the drovers, would have also brought news and information from along their route; thereby also facilitating the spread of knowledge and the broadening of horizons (Spufford 1984: 58).

To illustrate and expand on these issues of architectural and social change and to explore the concept of ‘connectivity’ and broadening horizons brought about by the developing and improving road and routeway network in County Durham and the north east region, examples are provided hereunder. The first uses architectural and documentary evidence to illustrate urban industrial activities and the development of urban vernacular architectural styles. The second explores the changes for the rural lower classes in the region, set against national examples and looks at the renegotiation of gender roles, in particular as seen in women’s roles and tasks within the household. The third example looks at the effects on the gentry class and the creation of a ‘middling sort’ exploring the evidence for the idea that new and changing identities were created by roads through travel, connectivity and wealth created through trade and industries served by the network. The locations of the properties in Durham City can be seen in figure 137.

7.2 Urban Vernacular Evidence: Industries, Trade and Development

This section uses architectural, archaeological and documentary evidence to illustrate urban industrial activities that required transport networks to feed their growth and also those industries that came about through the increased use of roads. The development of urban vernacular architectural styles, as driven by economic growth and a rise in class consciousness and facilitated by the improving infrastructure is discussed using number 5 Framwellgate, Durham City as an example (see figure 138).

The impressive Medieval architecture of Durham City's UNESCO World Heritage sites, the castle and cathedral, are well known and loved (for example see Bryson 1998). These high status buildings, however are not the only ones to have survived, number 5 Framwellgate[164], is an example of late Medieval urban vernacular architecture and is located to the west of the peninsula, in an area which, at the time, was experiencing a period of industrial growth.

7.2.1 Industries Using the Infrastructure

There have been two significant excavations to the west of the peninsula in Durham[165] City, one to the north of the Old Borough[166] boundary along Milburngate and one on Crossgate. The Milburngate excavation was carried out in 1983. Highly stratified organic deposits were found, with artefactual deposits beginning (in concentration), in the thirteenth century (Williams and Wood 1995: 59).

The Crossgate excavation took place in 1995. This showed intensive activity from the thirteenth century onwards including the 'dumping' of sand, the creation of a corn-drying kiln, the building of a revetment wall and the continued development of tenement plots. The first sign of physical tenement boundaries, freestanding walls, appear towards the end of the Medieval sequence (although other boundaries were most likely in operation before this point). Few changes in the layouts of the plots were detected from this point until the development of Archibald's department store in the 1950s when many buildings were demolished and a plateau was cut into the slope between North Road and Crossgate (Williams and Wood 1995: 47, 60).

Evidence for industries and other occupations in Durham City can be found in the excavations as well as documentary and photographic evidence. In the Milburngate excavations numerous horn cores were found. Documentary evidence shows that

[164] The spelling of Framwellgate or Framwelgate varies. Throughout this thesis, Framwellgate will be used.
[165] Excavations throughout Durham City are discussed in Carver and Gosling 1976.
[166] One of the core administrative districts of Medieval Durham.

skinning, tanning and horn working were prevalent in the area as early as 1316 (Williams and Wood 1995: 62), this continued until the twentieth century demonstrated by the fact that Blagon's Leather Works was a well known landmark on Framwellgate Waterside until it was demolished in the 1960s. Brewing was an important industry throughout the city and the kiln in the Crossgate excavations may be associated with this industry. Certainly by the seventeenth century Framwellgate was an area of relative prosperity dependent on brewing, dying and tanning all of which would have used the transport networks for the import of raw materials and would have used the same roads for the transport or 'export' of finished goods (Crosby 1990: 85).

Throughout the seventeenth and eighteenth centuries the area to the east of the peninsula, the Elvet area of Durham city, was also becoming a district of light industry, served by the same road network as the Framwellgate area of the city. Documents held in the Durham County Council Record Office show veterinary practices, blacksmiths, watchmakers, masons and a 'coach manufactory' (Ref No. D/X 409 ; Ref No. D/X 0820 ; Ref No. D/X 237/1-22). The creation of new industries such as coach manufacturers reflects the economic impetus that the road network provided. Not only did it provide a system for transport to be used by the expanding carriers' networks and increasing stage coach services, it also provided the impetus to create secondary industries to support and service them such as blacksmiths, wheelwrights, leather works and coaching inns, thus driving economic growth on many levels.

Although outside the remit for this thesis, in Durham City the tradition of providing stopping points for travellers has its roots in the Medieval pilgrimage 'industry' when the areas outside the peninsula, such as Elvet, provided inns and hostels for the pilgrims (McCombie 2005). Gray has been instrumental in demonstrating that the routes taken by pilgrims in Wales are as important and as informative as studying the shrines, churches and cathedrals to which the pilgrims were travelling (Gray 1996).

In County Durham work on pilgrimage routes research was carried out by Masinton in 2000[167], where he reconstructed pilgrimage routes to and through Durham Cathedral (Masinton 2000).

7.2.2 Architecture: Expansion, Extension and Transport of Material

As a result of widespread redevelopment, in particular in the 1970s, surviving vernacular buildings of the period up to 1650 in the Framwellgate area are rare[168]. Number 5 Framwellgate being one such surviving example; the end wall of the Fighting Cocks Public House is a clear example of a Medieval internal wall (from the building which had previously been next door); and the property occupied by Thornton's and the Ciao bakery and coffee shop[169] premises in front of the Milburngate centre entrance are of 'probable' early origin. The buildings next to number 5 are attributed to the period between 1650 and 1750 (Lowther *et al.* 1993: 113). Combined with the surviving buildings evidence from the rest of Durham it is suggested that the period up to 1650/75 was one of significant expansion (*ibid*: 108) (Ref No. D/X 0464 1745).

Number 5 Framwellgate is perhaps best summarised as: a vernacular building displaying use of local materials and building styles, comprised of multiple phases and extensive restoration. The initial phase of the building dates to the fourteenth century. It is a two-storey, box frame structure; the lower level is visible as stone, whilst the second floor is timber framed with plaster rendering. There are two main materials used in the building's construction, limestone and wood. Limestone is available locally: the eastern side of Durham County is sited on a large block of magnesian limestone, and to the west adjoining Cumbria is carboniferous limestone (Corfe 1992: 6). This use of local materials reflects it vernacular origins.

[167] As the Dissertation for an MA in Medieval Archaeology at the University of Durham.
[168] In the city as a whole whilst the 'core' of many of the buildings is Medieval substantial alterations have taken place.
[169] At the time of writing: 2011.

The timber framed upper half also shows many signs of restoration. The original timbers are of poor quality, comprising of thin, reused and waney (uneven) timbers. The sixteenth century author William Harrison attributes this to regionalism, the structures being "*…slightly set up with few posts…in the fenny countries and northern parts…where for lack of wood they are enforced to continue this ancient manner of building…*" (Harrison 1586 in Morriss 2000: 61, 63). The regional availability of wood would have been a factor, as would cost. Large timbers for continuing work on the castle and associated buildings were still available but would have been expensive and harder to get. Vernacular buildings in this area therefore used thinner timbers and woods other than oak e.g. ash and elm (Morriss 2000: 67; Emery 1994: 117). Some of the timbers are also reused showing that either the money for new materials or the materials themselves were in short supply or that the owners were particularly thrifty.

There are many phases, some more significant than others, to the building. The first is the building of the wing facing the river, in the fourteenth century. The second phase was the addition of the section at the back in the fifteenth century. It is possible to tell that this is a later addition because of the framework at the junction of sides. On one side the jowled or thickening head of one of the principal posts is visible, the rest 'hidden' in the interior whilst there is no post or jowl visible on the adjoining side. Had the building been built in one phase both sides would be likely to show a jowled post.

Another phase was the addition of two brick chimneys. It is unlikely that the first phase of the building included a chimney, as they did not become common until the sixteenth century (West 1971:95). As it is a box-framed structure on two storeys it might be have been possible, however, because the space open and available to let the smoke from a central fire diffuse would have been limited. The chimneys too have undergone several alterations: it is thought that they were substantially changed in the 1960s (*pers. comm*. Robinson 2005). The roofline itself has also been altered; a former roofline can be seen on the wall of number 4 Framwellgate that is slightly higher than its present placement and also in line with the rendered base of the chimney.

Whilst the principle of the chimney was known in England from the twelfth century it was not until the sixteenth century that they became common place, usually in the form of an addition to a building. Two possible explanations for the late uptake of a known technology are rising wealth or the falling costs of bricks or both, each of which are difficult to either verify or refute (Johnson 1993: 53).

One possibility not explored by Johnson is that the infrastructure across the country in terms of both carriers and road network had, by the sixteenth and seventeenth centuries, become one capable of transporting the bricks on a scale required for the insertion of chimneys into pre-existing buildings; not only in urban settings such as 5 Framwellgate but also, as shall be seen later, in rural settings. Fiennes writing in the late 1600s for example describes County Durham's network as being comprised of, *"…most pleasant gravell Road…"* and *"…a pleasant Road…"* (Fiennes 1888: 178, 179). This improvement, brought about by investment in the roads in County Durham, was linked to the general increase in both economy and wealth as key industries such as coal and lead mining expanded. Given that bricks are a bulky, heavy and potentially expensive commodity it has been assumed, however, that the availability of bricks for vernacular and socially middling houses was linked to the spatial propinquity to a higher status builder who retained the services of a brick manufacturer (Johnson 1993: 53).

Without clear evidence of the original internal plan or an idea of the function of different rooms, it is difficult to assess the social aspirations and the effects of travel upon the occupants. Several common themes, however, can be identified: a rise in wealth and status; and a rise in individuality and privacy. The box-frame allows for two separate floors and therefore more separate rooms, a move away from the 'open hall' plan with the hall being the focal point of the household Although a hall may well have still formed part of the household's plan in 5 Framwellgate, the possibility of there being more rooms is often associated with the beginnings of the 'rise of the individual' and an increased desire for privacy. The fact that a large extension is added is probably a sign of this continuation of privatisation, as well as showing that the inhabitants could afford to extend and wished to do so, perhaps as a display of their wealth. It may also have had practical and economic applications, perhaps the enlargement of a work area or a shop.

After many centuries of growth, development and redevelopment the late Victorian period saw a time of decline and the buildings in the area became 'slum tenements'. The next substantial change to the area came in the 1970s when these slums were demolished to make way for the Milburngate shopping centre, making the area's business predominantly one of retail and reviving the economic impetus of the area. This economic growth was again linked to creating accessibility by roads with the provision of car parks being key to the area's redevelopment (Crosby 1990: 85).

7.2.3 Conclusion

As discussed in chapter 4[170], during the period from 1500 to 1700 it is estimated that the road transport carrying industries experienced up to a four hundred percent increase in their trade and transport capacity (Chartres 1977a: 41). This supposition is supported by the architectural and documentary evidence from Durham where the creation of new industries such as coach manufacturers and the expansion of secondary industries such as blacksmiths, wheelwrights and leather works reflects the economic impetus that the road network provided. This economic growth was then, in turn, displayed in the architectural expansions and alterations seen at 5 Framwellgate, with the addition of brick chimneys and further living space.

[170] See section 4.3.3.

In a national context this urban vernacular example shows these architectural changes slightly later than in other locations but fits well within regional developments (Pevsner 1953; Garner 1989; Quiney 1990; Brunskill 1992; Heslop *et al.* 2001; Hicks and Horning 2006). This regionalism is reflected in the transport systems as, although the County Durham's internal carrier network was a coherent north - south system based on the Roman road network, Durham's inclusion on a direct route from London was relatively late, emphasising the strength of regional trade and transport systems (Clavering and Rounding 1995; McCord and Thompson 1998; Linsley 2002). For example the importance of the regional network of which County Durham was a part is clear from the fact that the ultimate destination of the longer distance lead routes was the Tyne at Newcastle.

A shift in, and centralisation of, power throughout the sixteenth, seventeenth and eighteenth centuries, as exemplified by the Treaty of Union in 1707 which affected the drove routes through County Durham and beyond[171], created an England controlled by one city, London, with previously autonomous commercial centres, such as Newcastle, becoming subordinated to it (Braudel 2002: 40-1). The increase in longer distance carrier traffic during this period also suggests an increase in London centric trade and a further sign of London's increasing commercial growth, prestige and power (Chartres 1977b: 77, 81), the evidence for which is seen in the architecture, in the form of national styles, and associated industrial growth.

In the north east, work and research on buildings, their development through the Medieval and Post Medieval period and links to local as well as regional trade, and economics has been much more prevalent in Newcastle upon Tyne for example see: Heslop and Truman 1993; Heslop *et al.* 1995; Heslop *et al.* 2001. Works such as these could vastly improve our understanding of the development of trades and industries in the Durham city and County Durham, in a national context.

[171] See section 5.1.

7.3 Rural Vernacular Architecture: Connectivity, Gender Roles and Social Aspirations

This section explores changes in consumption, architecture and gender roles, as influenced by the increasing connectivity affected by the transport infrastructure, for the rural lower classes in the region, set against national examples. Hutton-le-Hole in North Yorkshire is the home to a regional 'Folk Museum' of vernacular buildings of the north east region from the fifteenth to the nineteenth centuries. One of the buildings contained within this museum is 'Stang End Long House' (see figure 139) which, when studied on both a local and a national level, can be seen to show social, economic and historic changes which do not necessarily coincide. This example has been selected because, although not strictly within the study area, it provides a superb and relatively rare example of north eastern vernacular architecture from which the key themes of this thesis can be explored at a regional level.

7.3.1 Architecture: Social Display and Aspirations

The Stang End long house was moved to the museum in 1968-7 from Stang End, Danby where it survived in its nineteenth century phase and can be seen in a 1920s photograph of the house (Ellison and Watts 1996: 16). It is recorded as having undergone three major phases of development the first its pre-1700s phase, the second (and arguably the most important) in 1704 and later nineteenth century modifications (Greenwood 1999: 9). It is the 1704 phase that has been recreated and presented at the museum and it is the transition to its current format that will be the focus of study.

Pre-1704 the building's layout and form were simple and functional. Its basic plan was comprised of three bays (areas between fundamental parts of the timber framing) with two areas, a central two bay section plus a one bay byre for livestock. The arrangement of dwelling space, cross passage and byre defines it as a 'long house' (Grenville 1997: 136). These are often interpreted in two ways, in terms of practicality and in terms of social messages and ideologies. Functional explanations focus on the need to house cattle over the winter and the benefit of the warmth that they would provide. This is supported in terms of climatic changes taking place in the twelfth and thirteenth centuries, which led to a deterioration of conditions, that in turn corresponded with an increase in the numbers of long houses (Quiney 1990: 86).

The distribution of, and prolonged use of, long houses would appear to support this deterioration, as they are more common in the uplands of the north and the west, either as remains to be excavated (notably on sites in Dartmoor) or standing buildings. The Dartmoor National Park holds a reconstruction of a Devon long house. This is divided in the same way as the Stang End house but has a 'stone porch' and uses an internal jetty to create a small 'upstairs' chamber, which are common features of long houses in the south and west (Grenville 1997: 134, 147). Examples are known from the south east but they are not as common and do not endure over the extended periods of time seen in the north and west (Quiney 1990: 87). This may mean that past excavations have not been looking for long houses and have therefore not found them. It could be equally true that those studying the west and north uplands expect to find them and then do so.

The social interpretations are based on comparisons regarding the characteristics of Medieval halls which commonly have a tripartite layout of services, hall and private apartments (solar). A local example of this is Crook Hall in Durham. These are symbolically hierarchical with the space split between the high status solar and the low status service quarters, creating a progressive indication of rank (Grenville 1997: 89). Thus the long house can be seen to reflect the owners' superiority over their animals, just as the hall plan shows the owners' supremacy over their servants, with their superior position within the house symbolising their control over the natural world as: *"…social separation between animals and humans is one full of significance…"* (Brunskill 1992: 49). Even if this is accepted as a reliable interpretation of a long house it is not possible to say whether this was a consciously explicit message that the owners wanted to display consciously.

The house at this stage was most probably a cruck construction, with a thatched roof and wattle and daub walls. Crucks are defined by Mercer as *"…inclined timbers rising from ground level to an apex and serving as the trusses of a roof; the blades may be curved or straight, and may rise from a timber sill or from a low stone base."* (Mercer 1975: 97; Alcock 1981: 3). The oak crucks of the Stang End house are constructed in the most common way for the region. The two crucks are held by a yoke or a saddle with a ridge piece or tree over that (Alcock 1973b: 10). The source of the oak was the ancient royal forest near Pickering, which has since been replaced by the ubiquitous moorland[172] of North Yorkshire (Blizzard *et al.* 2000: 6). The house would have been built using four pairs of crucks to create the three bay building. The crucks supported the roof with the walls on the whole being non-load bearing structures, except for the spreading of the roof's weight. The roof was thatched and the most common material to use was heather, which was lightweight, abundant and durable, but turf and bracken were also employed (Blizzard *et al.* 2000: 12-4).

The structure of the walls is the aspect of the building which is the most contentious, because they could have been wattle and daub (simple woven partitions covered with a mixture of clay, straw and sometimes dung), stone or a combination of the two. It is this uncertainty that is the subject of debate regarding the interpretation of the excavations at Wharram where the building plans are the same as that of Stang End. Documentary evidence combined with a reassessment of archaeological evidence has moved the interpretation of the peasant housing from temporary to permanent but has still not determined the more detailed modes of construction (Wrathmell 1989: 4-7). It is generally thought that small 'ground walls' supported the crucks, giving additional height and protecting the wood from damp and with wattle and daub

[172] The moorland in North Yorkshire, in contrast to the North Pennines, is highly managed for the commercial interests generated by the red grouse which lives on the moors and would have a very different appearance if left to be 'wild' as it would change to scrub woodland (Ellison and Watts 1996: 31; Carstairs 2003: 111).

between supporting timbers. It is this interpretation which has been used by the museum in a recreation of a ‘crofter’s cottage’.

A key architectural change at Stang End took place in 1704. It is rare that a change can be dated so closely but documents relating to the renovations survive. The reason for the architectural change was a change of occupiers. John Huntley and Anne Scarth married in 1704, moved in and as still common practice today, made the home their own. The building was almost doubled in length through the addition of a further cruck, the cattle were removed to an external building and the old byre area plus the added length became a parlour, milkhouse and pantry. The cross passage was positioned as before but the central open fire was replaced by an inglenook fireplace and chimney in the forehouse, (although the fire would have still been on the floor), which enclosed the cross passage. The addition of a chimney negated the need for roof space for smoke to diffuse and two small ‘upstairs’ (or rather up-ladder) areas were created, one over the parlour and another over the forehouse. A critical change at this time was the conversion of the wattle and daub walls to full limestone walls, the material for which was quarried locally at Spaunton (Greenwood 1999: 5-10). Whilst this is an upward step and would have been at significant cost contrasted against the gentry of the time who were importing and transporting stone over significant distances, the use of local resource still characterises the vernacular nature of the building.

These changes brought about new forms of displaying social meaning. The uses of the rooms have been researched through the use of the inventory, made upon the death John Huntley in 1729 (Greenwood 1999: 10). The removal of the animals to a separate building shows a social move upwards with the improved building no longer needing the convenience of the animals close by and it also formed a physical separation from the inferior animals.

The creation of a parlour reaffirms this upward aspiration or shift, as it is a room associated with rising privacy and separation within the household, a stark contrast to the ‘one room for all’ of the previous plan. This is a change seen throughout the social spectrum, as the Medieval hall becomes ‘closed’. Their private chambers, and indeed the servant’s service rooms, grow in number and are more commonly used for specialised functions. Just as in houses of higher prestige of slightly earlier times the beds were kept in the parlour at Stang End. The Huntleys’ parlour, however, did not have the luxury of only one use because it was also the centre for the activities for weaving, an important home based industry in North Yorkshire (Nicholson and Fawcett 1988: 89). This reflects the economic situation of the time. The textile industry was becoming progressively more important, supported by laws prohibiting imports of cloth and exports of wool. The home manufacture of cloth was becoming more profitable as land taxes reduced the profit possible on crops (Hayes and Hurst 1989: 25-9).

The milkhouse is a room which has many different factors associated with it, not only social but also economic and gender issues as well. The milkhouse, as its name implies, was for dairying plus the production of cheese and butter. These jobs are traditionally associated with women. Popular household manuals such as ‘*The English Housewife’* from 1615 gave advice distinctively for women on cookery, brewing, baking and dairying as a natural and absolute division in labour was assumed by the author (Eales 1998: 78). Looking ethnographically at the separation in more modern times in the same rural area, it is clear that, whilst the women also helped with some of the physical agricultural labour, dairying was almost exclusively a female preserve (Hartley and Ingilby 1968: 16).

This separation of tasks was not a new one; even in the fourteenth century a wife was expected to run the house, brew, spin and dairy (Pollard 2000:192). The physical separation of the individual tasks to specific rooms was, however, new and could be seen to reinforce the woman’s servile position in a patriarchal society or to be increasingly visible symbols of the women's power, as dairying became an increasingly important part of the rural economy. The addition of dairies was a common feature throughout the country, either as embellishments to the service end, such as in the Weald where cool north facing rooms became milkhouses, or as separate buildings like the one at Manor Farm in Cogges, Oxfordshire (Quiney 1990: 189).

The forehouse retained the uses associated with an open hall: eating and gathering, as well as being the place where the food was cooked. Many architectural details give evidence as to its role and importance. The most striking change and feature are the fireplace and chimney. It is the only heated room in the house; even the parlour, a room usually heated at this time, was not at Stang End. The chimney and fireplace are large and of a type common to the area in the seventeenth and eighteenth centuries. The fuel used on it would have been peat, cut locally and stacked near the house (Hartley and Ingilby 1968: 63). The addition of chimneys is seen to occur with the enclosing of the hall in the seventeenth century. The addition of a chimney in the Stang End long house is a late example but would have still conveyed the message that the family were able to afford 'modern' amenities as well as providing added comfort and convenience.

The layout and changes in the Stang End house are similar to many buildings throughout the region. An example where the layout is the same, although the structure is different, is the Old Post Office in Lastingham, North Yorkshire. Here the pattern is the same, parlour and dairy (in a split bay), cross passage and a room with inglenook fire. The difference is in the orientation of the fire and the conversion of the former byre into an additional room on the north end that is dated by an inscription to the late seventeenth century. Woodman's Cottage in Spaunton, North Yorkshire, is exceptionally similar to Stang End house. It too is a cruck framed, thatched, limestone walled converted long house. It was rebuilt in 1695, only nine years before the other, having additional chimneys added in 1701. Its layout is almost identical, but like the Old Post Office it has another room beyond the forehouse as opposed to the dairy (Hayes and Hurst 1989: 96-7, 100-1).

The elongation of buildings through the addition of extra crucks is uncommon throughout the country. The box frame method of timber framing, using a lap tail dove joint (Grenville 1997: 36), allowed the construction of buildings with more than one (and a half) floors. The addition of new rooms with precise uses is a common feature but this is usually associated with the 'double pile' house, a building which runs at two room depths along its entirety (Brunskill 1971: 112). This was not possible with the retention of the cruck construction and so the regional pattern emerged. It is more likely to be that 'method of manufacture' rather than the north's perceived 'isolation and deprivation' prevented the adoption of the more widespread techniques.

7.3.2 Local Materials and the Localised Transport Network

The use of 'local styles' and 'local materials' reflects the many factors influencing the builders; the most significant being the availability of materials. Timber, heather and stone were obtainable without the added expense of costly transport and so they were what were used. Uniformity and conservatism in building style and technique is sometimes seen as 'provincial and uneducated', these styles, however, remained the same for good reasons: because they were functional, local craftsmen and the local people had the skills to build them and they could be created using purely local resources (Blizzard *et al.* 2000: 6). Evidence for a regional 'style' or 'tradition' of cruck based long houses can be seen in distribution plots for cruck types across the north east, where the vast majority in the region have one type of cruck joint, as seen in the Stang End long house (Alcock 1981).

In terms of its design the Stand End long house was a fairly common form. 'Spout House' of Bilsdale North Yorkshire taking the exact same outline and still surviving, occupied and in situ (Burns 1987: 99). More modified examples exist in Rosedale, again in North Yorkshire (Burns and Rigg 1988: 111). As a national phenomenon they are recorded as being most prevalent in areas where their interpreted use has the strongest support. Elsewhere cruck houses took on very different forms. Shropshire retains a number of single bay cruck cottages with two storeys, an example of which remains in use in Loppington with other examples being found in Much Wenlock (Garner 1989: 25, 54).

7.3.3 The Vernacular Threshold: National Context and Local Influence.

It is impossible to study a vernacular building and the associated literature without being made to think about the building's position in relation to the recurring themes: the 'Vernacular Threshold' and the 'Great Rebuilding'. The Vernacular Threshold is reached at the point at which buildings that can survive are built. This occurs at different times throughout the country, and reasons other than construction quality (e.g. fire, redevelopment) must be considered (Quiney 1990:7). This can be seen as closely linked to the idea of the Great Rebuilding, a period of large scale vernacular rebuilding between 1560 and 1640, identified by W.G. Hoskins in the 1950s. These ideas are debated as to their validity and their worth, but despite this there is thought to have been a change in building quantity and quality which seems to have happened at different times in different places (Spufford 1984: 1; Hoskins 1955).

Looking at the Stang End house with regard to its transition from 'unsubstantial long house' to 'substantial house' demonstrate a fundamental question. The previous building was merely modified so is the date of the later alterations the crossing of the Vernacular Threshold rather than the earlier works? Taking 1704 as a step upward in vernacular architecture and looking in general terms locally, the changes were made at the late end of a period of detectable alterations (the introduction of permanent walls replacing wattle and daub panels) in South and West Yorkshire. This has an approximate time band of seventeenth to eighteenth century. In North Yorkshire these improvements are thought to have come earlier making the change a comparatively but not an unreasonably late one for the region (Wrathmell 1989: 8).

On a national scale the view is somewhat different. Concentrating on buildings which have been defined as long houses, a change from long house to farmstead, where farming activities are carried out in a discrete building complex (or an increased number of rooms), can be seen much earlier. Hangleton in Sussex made this transition possibly as early as the thirteenth century (Grenville 1997: 144) and examples in Devon are thought to have been changed somewhat in the fifteenth or sixteenth centuries. The complexity of this shift cannot be easily summarised or explained as *"…the removal of animals to separate accommodation took place at different times in different geographical areas, and in some cases, the practice persisted until recently…"* (Grenville 1997: 151). Seen in terms of local and national trends the change in 1704 of the Stang End house must be seen as closely linked to local influences, as has been seen with the urban vernacular example of 5 Framwellgate[173].

In the eighteenth century cities with their 'urban renaissance' came to represent enlightenment, knowledge and modernity. Provincial areas were seen as the antithesis to this being the arena for superstition, prejudice and imitation of urban practices (Jankovic 2004: 175). Potential evidence of these superstitions can be seen at the Stang End long house which has a witch post carved with a St Andrew's cross, which supports the smokehood for the chimney installed by the Huntleys. This is a rare item and is one of less than twenty, all except one[174] being from the north east of England (Ellison and Watts 1996: 17; Rhea 1985: 176). Another example can be found in 'Winkies Castle'[175] a half cruck house in Marske-by-the-Sea, Cleveland. These talismans were believed to protect the family and demonstrate the beliefs of the time, which would seem closer to those of the fifteenth and sixteenth century when it

[173] See section 7.2.3.
[174] The exception is one from Lancashire (Rhea 1985: 176).
[175] Also called 'Cruck House'.

was general practice to ward off misfortune by wearing amulets or blessed herbs (Rolands 1999: 41). By the eighteenth century witches hunts had stopped but this does not mean that the belief in them had gone. People *"…might still believe in the existence of witches, but they were not allowed to burn them any more…"* (Hampson 1999: 269). Realising this fact prevents the interpretation of the witches post as showing a 'backward' social view, but instead one that was no longer so visible nationally or in an urban context.

7.3.4 The Movement of Goods and Investment in Commodities

By the fire are two fairly substantial, square indentations. These would have held salt and spice boxes (the spice box is recorded as being lockable). Harome Cottage, another local long house modified in the eighteenth century also has a salt box. These are important signs of prestige and trade. In the mid seventeenth century foreign trade with Europe had become widespread and was becoming increasingly organised and integrated. Goods from the 'New World' and Asia such as tobacco, sugar and silk were also beginning to be moved with increasing efficiency and by the mid seventeenth century these goods were accessible to people of every social class (Riley 1999: 252; Spufford 2000: 202). This opening up of items such as tobacco, pepper, pottery and cutlery to consumers of every social class was associated with the ability of the supply networks , of which the carrier routes and pack horse routes were a part, to flood the market, thus creating a drop in price (Appleby 2001: 43-44).

The travelling chapmen who specialised in selling many luxury items such as cloth, books, haberdashery items were increasingly becoming purveyors of high status items like spices. Goods such as spices and salt were also, more usually, sold by shopkeepers and as John Huntley had 'business interests' in Whitby, a major port, so it is possible that it was from here that the foreign goods were purchased (Spufford 1984: 58).

Although not strictly part of the architecture the furnishings and articles within the house can also be illuminating with regard to the inhabitants and the conditions they were living in. This is possible if objects are interpreted as not just commodities but fashions, social statements and as possibly holding deeper levels of meaning (Johnson 1996: 179-187). It is possible to do this for the Stang End house as John Huntley made a will and an inventory was made at the time of his death. These facts themselves are very informative. John Huntley was literate: a sign of prosperity in his family as at least a small degree of affluence was needed to manage without a child as labour (Spufford 2000: 219) and was deemed worthy enough, or had enough possessions, to require a probate inventory. Two limitations in this line of research exist in this example. The first is the general problem that it is other people, not the deceased who write the inventories and, second, that in this example a full copy was not available to study, only the summaries by Greenwood (Greenwood 1999).

It is known that the family had two beds, two storage chests, wooden trenchers as plates and horn mugs. The beds may well have been the most expensive items within the house, having two would have inferred status on the household. In other circumstances beds kept in parlours would have been more visibly on show. The use of wooden trenchers as plates can be seen a practical and economical solution for the crockery requirement. At this time, the mid eighteenth century 'craze' for white stone wares and porcelain had not started, it was however common to use separate articles of pottery to eat from. It must not be presumed, however, that the Huntleys were 'backward', as access to pottery goods may have been restricted and their desire to follow the fashion, low. The fact that they use horn mugs instead of glass could support the argument that they were poor or it could be seen to reflect their desire for the most practical goods.

7.3.5 Conclusion

Britain's colonial expansion in the seventeenth and eighteenth centuries created new regional, national and global economies, politics and cultural indicators as people renegotiated their ideas of geography and space (Ogborn and Withers 2004: 15). The ability of a family from rural North Yorkshire to buy spices demonstrates the degree to which these goods had become available to the general public. The fact that the box was locked shows, however, that they were valuable commodities and ostentatious indicators of wealth. A substantial increase in cartographical expertise and the growth in the printing trade meant that by the 1700s maps would have been familiar to most people. In addition an increase in literacy, better transport networks and an increasing access to foreign goods created an understanding of space and distance that allowed the development of the concept of their location within a wider geography (Spufford 2000: 207).

By appreciating that architecture does not restrain how people live and relate with their world and that fashions and trends do not always neatly explain architectural events and vice versa, an understanding of how the lower social classes viewed their world can be sought.

7.4 The Gentry: Architecture, Travel, Polite Discourse and Displays of Wealth

This example looks at the architecture of the gentry class, exploring the evidence for the idea that new and changing identities, such as the creation of a 'middling sort', were created by roads through the travel, connectivity and wealth which were significantly influenced by the industries which were served by and created the transport networks of County Durham.

7.4.1 The Architecture

Between 1689 and 1759 the Bowes family resided in numerous buildings throughout County Durham. These included two houses in Durham city, one on South Bailey (the Bowes altering it in 1689) (see figure 140) and one on Old Elvet (inhabited by Elizabeth Bowes until her death in 1759) (see figure 141). It was during this period that one building underwent reconstruction and one was constructed. The Bowes were a well-established gentry family of County Durham, who through time had consolidated their position in society through coal wealth, well-chosen marriages and shrewd political alliances (Newman 1999: 3; Green 2004: 74). The gentry were a class into which the Bowes between 1689 and 1759 fitted well, as whilst they were not aristocracy they were extensive landowners (Johnson 1996: 213).

This period in history is seen as being one of increasing stability, security and predictability linked to a decrease in warfare throughout Europe, improving climate and increasingly wider, global, horizons. These factors influenced many social changes, which would have been felt by and influenced the Bowes. *"From the late seventeenth century, élite status no longer relied upon gentility being associated to family and lineage, but was newly asserted through learnt codes of behaviour that defined polite taste and marked out a special role for material consumption."* (Green 2004: 72). Some of these changes can be seen as manifest in the standing buildings of the time owned by the family, which remain extant today (Hampson 1999: 264).

The Bowes' increasing wealth at this time is attributed to the hard work and astute business sense of George Bowes but was also due to the rising commercial use of coal, the raw material that he dealt in (Willis 1995: 6). In the period from 1640 to 1680 the coal output of Durham and Northumberland had doubled and it had doubled again by 1750. This led to the expansion of industry into a major sector of the north east's economy, at the same time as creating families of wealth and power such as the Bowes and led to the investment in and use of the transport network for both industrial and leisure purposes (McCord and Thompson 1998: 199-206).

Number 4 South Bailey is situated on Durham's peninsula, on South Bailey, the most prestigious address in Durham. The house was built in the fifteenth century by Sir William Bowes, split into tenements in the following century and redeveloped into the family's principal town house in 1689 (Kynaston and Johnson 1966: 20; Green 1996: 103; 2004: 74). The building incorporates up to five smaller buildings two or three facing the street and two, accessed by vennels[176], to the rear. The façade seen today is, for the most part, from the late 1700s although the frontage in the earlier part of the century is thought to have been similar. The vennel on the southern side of the house was, until the early 1900s when it was blocked in, still used as an access passage. The front is clearly split, the two storey northern part with a stone facing, the southern, three storey section is 'roughcast' which is the traditional northern name for rendering i.e. the plastering of an external wall with mortar (Ayres 1998: 246). An effort has been made to make the windows appear symmetrical, each storeys' windows are of the same size and the main door is centrally placed.

The application of a façade to an earlier building or buildings was common at this time (as previously discussed), especially in Durham. The style of the frontage which can be described as Georgian, a form encompassing many classical themes of order and symmetry, was imposed upon an unsymmetrical internal arrangement by the Bowes in a variety of ways, for example with the windows and the door (Little 1964: 177).

The windows of the Bowes' house are Georgian or balanced sash windows, with evenly spaced wooden glazing bars. The sash window, *per se*, came into general use in the late 1600s as glass technology improved and transportation of materials became cheaper with an improving transport network and increasingly reliable road links between manufactures and consumers (Morriss 2000: 115-7). Although the windows on each storey are the same size, the size on each level is not, the third floor

[176] Durham dialect for 'alleyways'.

having smaller windows. This is linked to the Palladian or Classical proportioning of columns where the base, the body and the top of the column all have set proportions in relation to one an other (Ayres 1998: 6). In a grander building such as Queen Square in Bath, this proportioning of the windows is easier to see as the building is more symmetrical and has complimenting columns. Most houses on North and South Bailey, as well as streets through out the city retain their original glazing bars and display the same compliance to the proportioning of the windows (Clifton-Taylor 1984: 198).

The main door of the house is Georgian in style with a pediment above two scrolled pillars. Number 6 South Bailey has a more elaborate doorway with a semi-circular pediment over two pairs of columns whilst 39 North Bailey has an identical example. Just as there are many examples of similar window designs and arrangements so too are there many comparable doors indicating that these were styles being used by more than just the Bowes family, because they were being used through out the city and indeed throughout the country.

Increasing wealth in certain sectors of the social hierarchy, including the one to which the Bowes family belonged, increased the consumption of commodities and architectural niceties. An example of these is shown at the Bowes' house: the elaborate door casing is a refinement but not a necessity. Money facilitated the change in the fronts of the houses, which in turn became ways to display wealth.

7.4.2 Signifiers of Education and Travel

The use of these Georgian architectural ideas is a telling social statement as the move to classicism contrasted starkly to the styles of town houses that had gone before and so an 'out of fashion house' was clearly visible (Borsay 2000: 105). The Bowes, as a wealthy gentry family would have wanted to follow this development as a show of their wealth and status. Its rise in popularity is often associated with several factors, mainly literacy, travel and wealth.

The Bowes' enterprise with regard to education as early as the fifteenth century ensured that the sons at least had good educations, many attending Lincoln's Inn of Court, some continuing to be educated in Cambridge University (Newman 1999: 25-6). The Bowes family were certainly literate and would have had access to the increasing number of architectural 'pattern books'. George Bowes is known to have subscribed to three influential books, W. Kent's 1727 'The Designs of Inigo Jones', J. Gibbs' 1728 'Book of Architecture' and Palladio's 1738 edition of 'The Four Books of Architecture' (Willis 1995: 8). These types of publication ensured the spread of the 'correct' styles and gave the customer power as they could ask for a specific design and not just accept the local building traditions. Material consumption was thus promoted through print culture, such as that found on the Bowes' shelves, that enabled provincial gentry to learn of, and take part in, the élite, polite taste of London. *"As signifiers of 'taste' material goods and printed texts were self-consciously regarded as defining social identities…"* (Green 2004: 72).

With improving infrastructures and a more settled political climate throughout Britain and European travel was becoming more accessible. The aristocracy had been travelling around Europe from the early sixteenth century in the pursuit of education and refinement. This fashion spread to the gentry and the 'middling sort' with 'Grand Tours' of Europe becoming almost set itineraries including sites mentioned in classical texts where the 'glorious past' and the 'degraded present' were compared (Bohls and Duncan 2005: 3).

At least one member of the Bowes family, William Bowes, is recorded as having been on a 'Grand Tour' visiting France, Switzerland, Rome and Naples in 1716 (Willis 1995: 2). Aside from international travel, more people travelled to London and would have seen the city's changing appearance. This breaking down of barriers meant a decrease in the architectural isolation of smaller towns and cities that were distant from London, such as Durham leading to increasing architectural uniformity throughout the country in styles adopted by the Gentry and the rising middle classes. This is in contrast to many vernacular buildings which retained individual regional styles for longer, as seen in the Stang End long house.

The concept of the 'gendered' route as seen with the drove routes is, within the sphere of travel by the gentry an interesting one as the trips undertaken by the gentry were clearly gender based. A classical education, with languages such as Greek and Latin, formed the basis upon which the fashionable young men could appreciate and learn from the cultural past presented by countries such as Italy and Greece during their Grand Tours. Young ladies however, studied modern languages and so their sphere of travel was usually confined to England. Continental travel for very wealthy ladies was popular but was and not undertaken independently, but with their husbands or family (Vickery 2009: 143). This gender division is seen in the Bowes family, with, as mentioned William Bowes undertaking the Grand Tour whilst Elizabeth Bowes is recorded as travelling to regional places such as York and Scarborough and less frequently to national destinations such as London and Bath (Green 2004: 85).

Furthermore, travel and mobility was seen to be the mark of an independent man, who would have been expected to travel for leisure, for the care and administration of properties and for work. Many professions increasing relied on travel, doctors and surgeons were required to have '*horses ready*', manufacturers and merchants increasingly travelled to investigate and establish new markets for their ideas and goods and MPs were obliged to spend time in London[177](Vickery 2009: 10). Other work, for example residing on a Turnpike commission, meant that they also had influence in creating and maintaining the roads they used, this echoes the drove routes, where use and creation were also bound by the gender.

[177] After 1688 MPs spent up to half of the year in London (Vickery 2009: 10).

The roads provided not only the means for the consumer goods to be transported but also a forum for the display of wealth and conspicuous consumption in the masculine sphere. Using the increasing regional industries such as coach manufactories, blacksmiths and leather works[178], records of the Bowes family from the time show that spending on '*men's tackle*', being items such as saddles, carriages, cart whips, blacksmiths bills, stabling for horses, harnesses and bridles, and the importance place upon it was considerable (Vickery 2009: 118; Ref No. D/St/Cl/3/70 1728-1730; Ref No. D/St/Cl/3/222 1759; Ref No. D/St/C2/3/155 1805).

7.4.3 Inside the Home

The internal arrangement of the house cannot be ascertained from the outside of a Georgianised building and their layout was determined, at least in part, by the arrangement of the original buildings, which were often Medieval in origin. The theme of number 4 South Bailey's plan is services to the right and rooms for the Bowes to the left. A striking difference in the social segregation of servants is that a complete shift from the Medieval times is apparent. Here the servants and the Bowes were completely separated, as the hall, formerly the place for the interaction of the two classes had become a small room, and was replaced by a private dining room. Whereas before being able to see the servants going about their work had given social status to the master and mistress now servants were to be 'seen and not heard' to minimise unpleasant noise, smells and interaction. This is manifest architecturally by the separate access to the service side of the house, the side entrance down the southern vennel and an independent service staircase. These features facilitated the servants 'invisible' movement throughout the house (Johnson 1996: 143; Green 1996: 104).

Not only are the doors and stairs physically separate, they are also diverse in their appearance. The main door to the house is elaborate whilst the service door would

[178] As seen in section 7.2.1

have been plain and functional. The service stairs are smaller than the main set which have large windows onto the street to give light. These features would have served to emphasise the social differences between the people within the house as well as forming *"…part of a defensive strategy against unwelcome and unpredictable territorial encroachments … (and)…enabling devices in the pursuit of convenience, comfort and privacy…"* (Bold 1993:115). An example of a building where the placement of the service stairs has been designed to create a hierarchical sensation is at Coleshill, near Birmingham. Here the servants' stairs are at opposite ends of the building's main corridor. In walking from them you are led to the main central staircase in the middle of the building: a powerful statement of the owner's central place in the household and the servants place at the periphery (*ibid*: 116).

The loss of a central hall as a communal room, the increase in rooms with specific uses and moreover allocated to specific people is seen as an indication of the 'rise of the individual' and with the accompanying rise in the desire for privacy. At the Bowes' house this rise of the individual and the associated privacy is seen in a multiplying number of rooms for example a private dining room was available for meals, rather than eating in the hall. A second storey allows for private rooms upstairs and a third storey for the more removed servants quarters. One problem however in equating an increase in rooms with a connected desire for individualism is that inadequate evidence exists to determine the degree to which the wishes of earlier generations matched those which are so strongly evident in the architecture and supported by writers of the seventeenth and eighteenth centuries (Bold 1993: 116).

7.4.4 National Style: Transporting and Importing the Architectural Fashions

Number 4 South Bailey is comparable to many houses in Durham in terms of its façade. Pevsner notes that, *"…in North Bailey the impression is one of solid eighteenth century…"* (Pevsner 1953: 133) (see figure 142). This eighteenth century impact is created by a whole series of houses with Georgian façades hiding buildings of much earlier periods, evidenced by offset doorways, uneven window spacing and uneven interiors. The Georgian façades create a uniform appearance, highlighting the merits shared by the different buildings and echoing the ideals of 'urban Enlightenment', which saw architecture as a way of *"…nurturing a sense of corporate public consciousness…"* (Borsay 2000: 108).

The building accounts indicate that between 1736 and 1740 a new town house was built specifically for Elizabeth Bowes (Ref No. D/St/E8/9 1740). It was located on Old Elvet and stands today, much altered, as part of the Royal County Hotel (whose restaurant was previously called 'The Bowes Restaurant'). No original plan of the building is available but there exists an extensive range of documents associated with the building including an account of expenses for its construction, a probate inventory listing the items within the house upon Elizabeth's death and a list of measurements (Ref No. D/St/E8/12 1763). The list of rooms and contents in the probate inventory can be used to deduce many social aspects shown in the house's architecture; with the expenses giving an insight into the construction process and the materials used.

Building at this time was *"…suspended between Medieval tradition and industrial innovation…"* (Ayres 1998: 7). As a consequence building remained labour intensive and strongly dominated by men, with women sometimes engaged in marginal roles. This gender division is clearly substantiated in the documentation, as the majority of the workers to be paid are men whilst only one mention is made to women, "*To the women for carrying water to all the lime…*" (Ref No. D/St/E8/9 1740).

The building materials noted include brick, stone and alabaster (Ref No. D/St/E8/9 1740). The inclusion of alabaster, a soft fine-grained pinkish mineral gypsum, an exotic material, demonstrates the effect of long distance and international trade that was continuing to become an increasingly integrated system (Rapp and Hill 1998;

Riley 1999: 253). Using unusual materials would also be a sign of higher social status as they were more expensive and still more difficult to obtain.

The façade seen today is not the original one. It covers three buildings and is currently thought to originate from the Victorian period. The positions of the windows and the door are, however, original although the forty-four sash windows which are recorded as being repainted in 1762 have been replaced, with the possible exception of the top storey Georgian sash windows (Green 2004: 82; Ref No. D/St/E8/4-14 1762). Looking at the placement of the windows and door the symmetry of the building is immediately more obvious than that of number 4 South Bailey. The entrance is centrally placed and the windows on each floor are the same size. Their sizes, as before, can be linked to Palladian proportions.

7.4.5 The Creation of an Oasis of Politeness

The rooms listed in the probate inventory for the late Ms. Bowes are a dressing room, drawing room, little dressing room, Mrs Bowes' room, laundry, maid's room, Mrs Thorpe's old room, green room, best bed chamber, best parlour, hall, Mrs Thorpe's little room, cotton room, garrets, kitchen, pantry and cellar (Ref No. D/St/E8/10 1759). One advantage over studying a plan is that the uses of the rooms are identified. Looking at the names of the rooms, it is apparent that rooms with specific uses and allocated to specific people are present, for example Mrs Bowes' room and Mrs Thorpe's little room. This supports the ideas of rising individuality and privacy associated with this period and identified in the plan of the Bowes' other Durham town house.

The inventory also helps to determine the use of the hall itself and therefore address its changing role within the household. The hall contained two large dining tables, six walnut tree chairs, two armchairs, window curtains, a round mahogany tea table, and a carpet. The fact that the hall still contains dining tables indicates that it had not been relegated to the entrance hall status which it holds today; this is supported by the absence of a dining room, *per se*, in the list of rooms. There is a 'best parlour', however, where guests could have been entertained thus taking away at least some emphasis from the hall; for example Elizabeth Bowes used the Elvet house to host social events to promote Sir George Bowes' political activities, helping to gather votes for his re-election as MP for the county (Green 2004: 75)

Contrasting with the male displays of consumption on the road[179], the parlour and entertaining the transport network provided '*access to oases of politeness*'. It gave women the chance to express their graceful and educated choices through the display of goods transported on the roads, with wares such as china and consumables such as tea (Vickery 1999: 9, 10, 277).

The rise in the standard of living is also apparent. There are window curtains and carpets recorded in most rooms, the curtains stopping draughts and providing privacy and the carpets providing comfort and warmth (Ref No. D/St/E8/10 1759). A limitation of using documentary evidence is that it is all subjective both in its interpretation and in its recording. It was not Elizabeth Bowes, the occupier, that wrote the inventory but other people on her behalf. She may well have called her 'hall' a dining room showing a more progressive internal naming of rooms.

Social segregation, as discussed for number 4 South Bailey, is also indicated in the Old Elvet property but in different ways. The tangible belongings in the room reserved for the owner and those in the maid's room can be compared. Elizabeth Bowes' room contained a yellow feather bed, a bolster, pillows, quilts, blankets, a mahogany set of drawers, a walnut tree dressing table, table and chairs, a carpet, a fireplace and utensils and yellow curtains, indicating a high status room with high

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[179] See section 7.4.2.

quality furniture of imported wood and a high level of comfort. The maid's room contains three pairs of old drawers, a small table and chairs, a green bed with bolsters, pillows, quilts and blankets (Ref No. D/St/E8/10 1759). This would appear to be a more functional room with similar items but of lower quality and smaller. This is probably linked to the size of the rooms which could be compared with plans. The servants' room has no mention of creature comforts such as curtains, carpets or of a fireplace which would not have been seen as befitting the servants' status; this together with the architecturally visible segregation would have been powerful messages regarding the varying levels of society within the house (Ref No. D/St/E8/12 1763).

Although the Old Elvet property was a new house, and shows some Georgian features, compared to Eden House on South Bailey built only ten years earlier, it is a much more modest building. Eden House, now St John College entrance, is often seen as the only true Georgian building in Durham. The previous buildings on the site were replaced by a 'pattern book' structure encompassing many more Georgian features such as entering the building on the first floor and creating a frontage tall enough to hide the roof and give a straight line to its appearance (a reaction to the steep roofs of vernacular houses) (Muthesius 1982: 12).

The unpretentious nature of the Old Elvet property is perhaps strange considering the Bowes' status and wealth. At this time they were involved in building much more elaborate buildings including the chapel at Gibside the planning for which began in 1737 (Willis 1995: 52), perhaps an indication that they consciously chose which buildings to invest in.

7.4.6 The Bowes: Conduits for Communication

The Bowes, as one of the coal-mine owning families of the north east, were part of a distinct elite. They shared the values of their national counterparts in the gentry class but as with the lead miners of the Pennines, the shared experience of, and involvement in regional industry gave them a distinctive facet of identity connected with mining. For the mine owners, rather than being based on working in the mines, this distinct aspect of their identity was centred on their ability to commercially exploit their holdings to increase their wealth and power (Newton 2004: 37, 43). As part of this commercial endeavour the transport network of County Durham therefore contributed to the formation of the identities of families such as the Bowes because the roads were created by, used by, and maintained by them. The extent of this involvement in the roads and routeways of this is evidenced by the late arrival of Turnpikes into the county; the routes that had been developed by the industrial elite for their own profit, having negated the need for a Turnpike Trust to create new roads[180].

As discussed in section 7.4.2, men could be expected to be away from their place of residence for protracted periods of time. Such was the case with George Bowes who spent half his time in London and half on his estates in the north east. He therefore relied on regular communications by post from his employees to keep him up to date with his business interests. Records provide evidence that he was concerned with the transport conditions for his coal and lead interests (Brown 2010: 100; Ref No. D/St/C2/3/76 1759 Ref No. D/St/E8/36 1736-7; Ref No. D/St/C/3/77 1759). It is clear that he understood the need for the transport to be carried out in an expeditious manner and for it to be cost effective as the transport element of the industrial process directly affected the profit margins of his interests. Records show that in the mid 1700s he took considerable care to both pay the market rate for the pack horse

[180] It is therefore unsurprising that when they were introduced to County Durham the Bowes were involved in this further investment in the county's infrastructure (Ref No. D/St/Cl/3/1 1723-1758).

transport of the lead but also to engage the services of the jaggers with the speediest reputations to carry out the work (Brown 2010: 277-278).

As well as the road networks the Bowes invested in other transport network types. As discussed in chapter 6[181], the coal trade in the north east was controlled by a partnership of wealthy coal owning families, including the Bowes, called the 'Grand Allies'. This group funded additions to the waggonway network for mutual gain. Later they also funded and sold land rights and wayleave for the railways. (Ref No. D/St/C1/3/34 1723/4; Guy and Atkinson 2008: 163).

Routes such as those used by the miners and the packhorse affected families like the Bowes indirectly, terms of wealth and income, rather than their direct use of them. It was the network of re-used Roman roads, however, that allowed them to buy into fashions and to display their social status, in terms of architecture, travel and displays of consumption on the road and at home. The idea that the Bowes could be affected by routes that they did not physically traverse raises the question of the interaction between the routes and their users.

It is easy to paint a picture of an un-integrated network: the drovers would have interacted with a limited number and type of people for example, farmers and inn keepers; those involved in the lead industry formed part of a relatively closed community and would have interacted with people such as the peddlers and itinerant traders; the gentry travelling to London would not have come into contact with the lead miners[182]. This thesis however, argues that it is this segregation that gave County Durham's infrastructure strength.

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[181] See section 6.5

[182] This echoes the segregated nature of the "busy gap rogues" and the guildsmen of Newcastle (Crow 2007: 324).

The idea of that exclusion provided integration and a holistic network, is perhaps, at first glance a strange idea and yet the nature of the goods ‘travelling’ the disparate routes, would have caused havoc if part of an ‘inclusive’ network. Cattle, horses, waggons, carriers, carriages all on one route through County Durham would have been a less commercially and economically viable option. Due to the fact that the landscape (and ownership thereof) of the county allowed for separate systems that, in turn created an integrated network comprised of the separate transport systems, that as a whole was both powerful and successful network.

Despite Elizabeth Bowes describing herself as a “*clumsey country girl*” she participated in forms of consumption that fitted the national pattern rather than a distinctly regional one (Green 2004: 86). This contrasts with locations such as Colne and Burnley, Lancashire, which were remote from north – south roads such as those found in County Durham and as such became a byword for inaccessibility (Vickery 1999: 15). In County Durham, therefore, the gentry, through the connectivity gained by the transport network which they used, invested in and in parts created, experienced changes in consumption and fashion, led by London, in a timely manner whilst at the same time created a distinctive identity based on business acumen and entrepreneurial endeavour.

7.4.7 Conclusion

The period between the Bowes’ alterations to Number 4 South Bailey in 1689 and the death of Elizabeth Bowes in 1759 whilst residing at the house on Old Elvet resulted in the modification and creation of two buildings which can be seen to fit within a wider, national pattern of the time, both architecturally and in their social inferences. The houses’ different origins did not prevent the Bowes using them to give the same impressions, to enforce segregation and of social difference whilst encouraging individualism and privacy. The use of two different types of resource, architectural plans and historic documents, highlights the fact that a great deal of information regarding the architecture and social implications of a building are lost when only limited records are available. It must also be realised that, even with a complete, unchanged, fully documented building, architecture alone does not control how people live and interact with their world and so we should not let purely architectural evidence control our interpretations (Hanson 1998: 77).

The Bowes have been shown to be a powerful family in the use of and the creation of transport networks. Their astute economic investments in the infrastructure associated with their interests in both coal and lead mining, gave them not only the capital to spend but also a forum in which to display their mobility and wealth.

7.5 Chapter Conclusion

This chapter has examined the broadscale effects of roads and routeways in the north east region, brought to the immediacy and intimacy of the home environment using three diverse regional architectural examples. In so doing it has shown that during the period from 1530-1730 the roads and routeways of County Durham and the north east region helped to drive new aspirations and patterns of consumption, facilitated the exchange of information and fashions and helped to provide new sources of wealth. Thus the roads and routeways were, in part, influential in the rise of class consciousness and also the ways in which these emerging groups physically displayed their wealth and desires, both at home and on the road.

The different networks of roads and routeways across County Durham such as the re-used Roman roads, the drove routes and the lead routes that, whilst often used as individual components created a functioning and conceptually integrated network, brought with them the new concepts of national and international ‘connectivity’, allowing a changing social elite, the gentry and the rising ‘middle-classes’, to become more nationally unified in their aspirations, fashions and architectural ideals. The vernacular classes too, had the opportunity to ‘buy into’ elements of architectural styles and new patterns of consumption, demonstrating the extent to which the roads affected every level of society.

The ways in which these changes were expressed architecturally were in the move to a ‘closed house’, with the insertion of chimneys and through the increasing uniformity in architectural styles, themselves influenced by travel. Clear architectural demonstrations of the importance of the roads and routeways on a functional level have been presented, for example the increase in the number of imported goods within the home, as seen with the spices at the vernacular level or the use of imported stone with the gentry.

Money and transport were two of the means that the roads and routeways provided to promote the rise of class consciousness. They helped to create increased spending power of those whose wealth was generated by the burgeoning north eastern industries which used different routeway types to maximise efficacy and profits. The improving ability to transport goods and materials over increasingly longer distances, allowed the transportation of materials such as glass, brick and imported stone, thereby making them available on demand; thus the transport networks brought to the fore visual indicators of social difference, which in turn reinforced the new social groupings.

The process of change, from the 1500s ‘open house’ to the ‘closed house’ of the 1700s and beyond was a long, complex and varying process. The rise of the ‘individual’ and the rise in ‘class consciousness’ and the ability to identify these concepts through the study of house types is no less complicated. Individualism can be interpreted as several things, the need for personal space that brings privacy and with it, the implication of an independent mode of thinking and attitude to life or the assertiveness to display personal likes and dislike through the medium of architecture. It is interesting to note therefore that whilst houses became more and more private and segregated they also lost their uniqueness in the quest for perfect symmetry.

Fashion it would seem dictated a style that people used to be able to express their individuality and to set them apart as an individual group be it the vernacular, the ‘middle class’, the gentry or the elite. In their uniformity they became individual social strata.

The connectivity that the roads and routeways brought created a nation with greater geographical, cultural and social knowledge that stimulated an increase in class consciousness. The improved transport systems both helped to create the increase of class consciousness and allowed this new consciousness to manifest itself visibly through architectural changes. The improving ability to transport goods and materials over increasingly longer distances, allowed the transportation of materials such as glass, brick and imported stone, thereby making them available on demand; thus the transport networks brought to the fore visual indicators of social difference, which in turn reinforced the new social groupings. It can therefore be argued that not only did the roads help to promote a rise in class consciousness that they also provided the means by which these new ideals and ideas could be expressed.

"The real voyage of discovery consists not in seeking new landscapes but in having new eyes…"
(Proust 1871-1922)

8 Conclusion

Roads and routeways, whether engineered or created ad hoc, add a vital and dynamic element to the lives of those who use them and facilitate many features of day to day life. For example they permit movement and trade, can determine economic and military success and can also represent freedom and oppression. As such they have been a fundamental and powerfully ideological part of human existence and yet the factors most commonly studied in relation to roads are only topography, engineering capabilities and traffic. Whilst these factors are significant this thesis has used a unique suite of theoretical and landscape approaches to examine the road and transport network in County Durham from 1530-1730, and has argued that a road is a social construct as much as a functional-economic one. The concept of cultural landscapes, together with the concept of the taskscape has been used to support both the functional and the emotive 'being in the world' aspects of the landscape analysis generated by the GIS. This has allowed the powered dynamics brought to and created by the road and routewayscape to be successfully assessed for the first time in an integrated way.

8.1 Road and Routeways: Indicators and Creators of Facets of Identity

The concept of the "powered cultural landscape" is one that that has been significant in this thesis. It has been shown that roads and routeways created a cultural landscape and that the power relations expressed through this cultural changing of the landscape such as gender, age and occupation represent many facets of identity which affect and were effected by the roads and routeways in County Durham.

Throughout this thesis the differing ways that various professions, ethnicities, classes and genders that used the roads to create and re-enforce, or change, their identities have been explored using evidence and examples such as changes in architecture, the rise of regional industries, the display of items associated with travel and the consumption of goods that traversed the globe to reach people of every social class.

The Romans used their identity as a conquering force as a power dynamic, using both the appropriation of routes and the creation of new roads to demonstrate their domination of the landscape and people. Work on the Roman roads and the resultant 'roadscape' transformed the cultural landscape, creating one which represented the superior engineering skills and reinforced the subjugation of the natives. The ideological themes of authority and supremacy were also demonstrated because the roads took the most direct and convenient course, without adhering to the socially constructed constraints such as land ownership, land use or pre-existing political boundaries thereby further asserting their domination over the local population and the landscape.

The drove routes in County Durham were created by men and used by men, giving weight to the conclusion that certain routes were imbued with gendered power dynamics. The drove routes helped to create and maintain the identities of those that used them. The Border Reivers' unique Anglo-Scottish and ethnically powered identities, within the context of their use of the drove routes that came through County Durham from Scotland, were distinct, and almost diametrically opposed, to the identities of those involved in the cattle trade. The Border Reivers used the routes to steal cattle, whilst the drovers used them to transport cattle to their destination professionally and proficiently. This served to reinforce the drovers' identity as respected, honest, diligent and professional men. This level of professionalism would have developed through continued use and experience of the routes and the surrounding landscapes additionally through their continued expert use of the routeways, their own professional standing would also have grown commensurately and improved over time.

The interplay between the drovers and the Border Reivers created a route type which excluded women, as they were seen as 'unsafe'. The drovers exemption from the Disarming Acts reinforced the powerful masculine identity and perception of the routes, their use and their users

This thesis has shown that identities in the north east are complex. The lead mine workers of the Pennines, through the exploration of identity as experienced from the use of the lead routes combined with the taskscape, provides an example of strong regional identity based on locality, shared professions and experiences rather than ethnicity, gender or childhood.

It has been shown that those engaged in the lead mining industry and the use of the lead routes were not only males with the role of miner as might be expected, but also children and women. For the miners, smelters, washing floor boys and women the conclusion has been drawn that the use of the packhorse routes and the regular traversing of the landscape would have served not only to take them to work but also provided an opportunity to see the technological advancements within the industry, of which they were a part. This in turn would have developed and changed the cultural landscape, but also provided the miners with a geographical overview of the landscape, beneath which they worked.

The lead routes provided ways by which the workers got to and from work and were also used by itinerant traders bringing their goods and news into the area. The planned liminal placement of the lead routes in relation to the patterns of upland agriculture permitted the transportation of goods on low maintenance routes without damaging agricultural imperatives. The lead routes also demonstrate the duality of the professions of those living in the ore fields of County Durham, whereby the routeways and the farming were required to co-exist.

The Pennines are seen now as *"…potentially a region in its own right, with a lead mining industry and vernacular architecture…with no framed regional identity."* (Green and Pollard 2007a: 210). Having explored the identities that were present and emerging in the period from 1530-1730 this may be seen as surprising, but the collapse of the lead industry the 1800s resulted in the loss of the professional identities and also to the mass emigration of whole communities of those who had created their homes and identities in the marginal uplands of County Durham.

The Bowes, as one of the coal-mine owning families of the north east, were part of a distinct elite with a duality in their identities. They shared the values of their national counterparts in the gentry class but created a distinct regional aspect of their identity through their commercial and industrial acumen. The transport network of County Durham therefore contributed to the formation of the identities of such families, strengthened the class identity of the gentry and promoted a rise in class consciousness. In County Durham the Bowes can be shown to have been influenced by many different road and route types. They invested in the lead routes, waggonways and later in the Turnpikes and as such their identities were affected by routes that they did not actually physically experience themselves. The network of re-used Roman roads provided the forum and access to goods for social display, allowed them to import expensive stone to front their houses and provided the expedient postal service upon which they relied in order to receive information, including reports on the conditions of roads that could have affected their business adversely.

The north east gentry highlight the complex nature of identity, both in its composition and display. An individual such as Elizabeth Bowes was gentry, a woman, educated and unmarried which helped to create aspects of her identity which was also affected by the over arching identity bestowed upon her by her family name. The identities that the roads and routeways helped to create could also change over time, as seen with the women associated with the lead mining industry who during the period to the mid 1700s were part of the lead mining suite of professions but by the 1800s were actively excluded from it. This in turn would have changed their personal identities and their use of the lead routes, as over time they became more influenced by other peoples use of the routes such as their husbands, children, and chapmen. Conversely, as the women withdrew from lead industry work, boys took their place and so over time the lead routes influence on the boys was greater. Here the knowledgeable routine occupation of the landscape and how it should be traversed was fundamental to the reproduction of the identity of the *community* as a whole.

8.2 Roads and Routeways: Conspicuous Consumption

In this thesis the social identity of individuals and that of communities was examined as an aspect of class consciousness, and the use of and the effects of the use of the varied road and routeway networks has been used, most specifically in chapter 7 to address the questions raised in chapter 1, "*Does the Post Medieval period see a rise in class consciousness?*" and *"How is this reflected in archaeology and architecture?"* (Petts and Gerrard 2006: 182). This thesis argues that roads and routeways were also the arteries of the dissemination of cultural ideas and directly affected aspects of consumption. It has also been seen that, with the developing built environment and improved access to information, the roads and routeways contributed to, and created aspects of, consumption and provided various means of creating class consciousness through conspicuous display.

In the period 1530-1730 the re-use of the Roman roads for carriers, post and coaches, the drove routes providing additional links to London and market towns and the lead routes which provided access routes for itinerant traders all brought with them the concept of national and international ‘connectivity’, just as the Roman roads themselves had done centuries before. This allowed a changing social elite, the gentry and the rising ‘middle-classes’, to become more nationally unified in aspirations, fashions and architectural ideals. In County Durham these changes can be seen to be taking place before the arrival of the turnpikes into the County, lending weight to the argument that the transport network in County Durham was integrated, even if it comprised distinct components, and it can therefore be deemed to have been successful.

Women of the gentry expressed their refined and educated choices through the purchase and display of goods that had been transported on the roads, with wares such as china and consumables such as tea. Importantly, however, the roads provided not only the means for the consumer goods to be transported but also a forum for the display of wealth and conspicuous consumption mainly in the masculine arena. Through architectural and documentary evidence, the gentry in County Durham have been shown, through the connectivity gained by the transport network which they used, to have invested in and in part created, to have experienced and displayed their changes in consumption and class consciousness, led by London, in a manner more timely than had been possible before.

Whilst the changes to the houses of the gentry match national developments in a national context, the urban vernacular and the vernacular examples discussed in chapter 7 show architectural changes in County Durham and the north east slightly later than in other locations. This could be seen to reflect the important regional economic developments which emphasised the importance of the internal regional networks serving places such as York and Newcastle of which County Durham was a part.

With the paucity of work on architecture specific to the lead mining areas of County Durham the implication has been made by analogy to other vernacular styles of architecture. Some work on architectural styles in the Pennines has been done by others for example: Brunskill 1976; Crosby 2002; Forbes *et al.* 2003, but more research, specifically into settlement, communities and architecture associated with the lead industry are needed in order to be able to look at the effects of the infiltration of connectivity created by the transport networks in the Pennines and to investigate the now lost identities of the Pennines. This would, for example, provide the opportunity to see the difference in the consumption patterns between the lead mining communities and communities on the coal fields where the wages of the coal miners were both higher and more stable. As yet the focus of research into the industry of County Durham is predominantly focused on industrial processes themselves rather than those who worked in the industry and their families.

8.3 Roads and Routeways: Functionality

The Roman road network brought a means by which military, economic and social travel could take place and these fundamental purposes have been shown to have persisted, forming a cognitive and physical basis to the road system of County Durham from 1530 to 1730. The success of the network can be seen even today as many roads still follow many of their original courses. The military and functionalist desire and need for a direct route, with short distances and moderate slopes, have been shown to be key factors in the placement of the Roman roads.

The roads from 1530 to 1730, although in poor repair in comparison to the highly engineered surfaces created by the Romans, were adequate to provide a substantial, extensive network for carriage, postage and coaching which grew to cover the whole of England. The evidence in this thesis challenges the idea that the roads were treacherous and impassable; although it must be conceded that in places they were far from ideal, having been heavily used during the Civil War. Yet the disparate users including carriers, coaches, armies, the post, travellers and traders all used the extensive and effective communications network based, in part, on the Roman road system and this helped to drive the economic growth seen in this period.

The drove routes in County Durham provided a network of routes whereby cattle could be moved through the county with the least inconvenience to both the drovers and the residents as reflected in the land use types crossed. This thesis has shown that the creation of the drove routes was driven by a need to maintain a suitable gradient for the animals, the need to feed the animals and a preference for maintaining visibility along the routes on the approaches to towns along the way. These imperatives had a basis in economics as the cattle were valuable commodities, the value of which could have been adversely affected by the routes.

The drove routes also affected the local economic systems but whilst the drove routes played a role in the market and trade patterns of County Durham, the shift in the location and numbers of markets in County Durham was due to a number of factors. The overall contraction responding to the national imperatives and changes, but with the expansion in the west of the county due to the droving trade and the lead mining industry bringing with them new settlements, new economies and driving new patterns of consumption. An area of research that would help to clarify County Durham's place within the national economic framework would be research into the regional carriers in Post Medieval north east England as research into the carriers of Post Medieval England is predominantly London centric (Chartres 1977a; Gerhold 1988; 1993b; 2005). Whilst London was a major nodal point in the transport network of the country, an evaluation of regional carrier services, centred on other important trading centres such as Newcastle, would add greatly to the knowledge of both the regional road use and regional economics.

Through the execution of this thesis' methodology it was found that the packhorse routes associated with the lead industry in County Durham had an important role in the contemporary landscape. They were the backbone to the lead industry's economy, built on (and by) the lead industry. The course of the routes was influenced most greatly by the economics, which created a range of factors that needed to be observed if the system were to provide a cost efficient and speedy solution to the transportation of the ore, lead and the industry's ancillary needs. The routes had to be composed of slopes suitable for the heavily laden pack animals, with no excessive distances, in addition the land over which they carried the ore and the lead had to have no disproportionate requirement for engineering or maintenance works which would impact on the profitability of the lead itself. The economic considerations of the companies also recognised the miners' need to supplement their mining income with farming, and thus the routes avoided, where ever possible, the land suitable for even liminal agriculture. After all, without lead industry workers there would be no lead to transport.

The fact that the lead companies, such as the Blackett-Beaumonts, and families such as the Bowes invested in the roads, and in this case the packhorse routes meant that the roads and the packhorse routes ultimately became an integrated system with, in the mid to late 1700s, the ore being transported by packhorse to the smelting mills and the lead by cart to the port at Newcastle. The packhorse routes, therefore provided an infrastructure that served the developing and improving road system. The lead routes not only co-existed with the drove routes and the re-used Roman roads but formed part of a network which, through using different network types for different tasks and purposes, gave economic coherence to the overall transport system of County Durham. As seen in chapter 7 this is evidenced in the records and correspondence of the time.

8.4 Roads and Routeways: An Archaeological Resource

Roads and routeways currently remain an underused and undervalued resource, in large part because of the difficulty of dating them accurately and confidently.

Specialists on the subject of roads, tracks and routeways accept that they are hard, if not impossible to date. One of the ways in which the changing resources and technologies available to researchers may be able to make roads and routeways more accepted as basic and informative archaeological artefacts is through the continued investigation into how to date them. As part of this thesis a trial of three dating techniques was under taken OSL, IRSL and radiocarbon dating, and are presented in chapter 3.

The section of Dere Street excavated as part of the dating technique investigation was treated as the 'find' or 'artefact' and rather than relying on associated finds, place names or its shape, fills from the road, the ditch and the build up of contexts after its disuse were used to trial the luminescence dating techniques OSL and IRSL. Additionally radiocarbon dating was used to assess its suitability as a dating technique for roads and routeways in a context other than prehistoric trackways and to provide a comparison to the dates provided by the luminescence techniques.

This feasibility study into the excavation and dating of roads created more questions than it solved but the production of the workable methodology as part of this thesis indicates that scientific techniques, such as luminescence, may indeed provide a solution to the problem of dating roads in the future. The continued research into the development and refinement of the techniques could therefore result in a systematic scientific dating approach, which in combination with current archaeological techniques will provide an invaluable tool for archaeologists. This thesis in addition to piloting new uses for dating techniques has shown, however, that roads and routeways themselves can be viewed and used as buried and extant artefacts, even without a technique suitable for dating the road itself.

8.5 Conclusion

This thesis has challenged the assertion that routes changed little from the Medieval period until the Industrial Revolution and, for County Durham, shown it to be incorrect. Harrison uses the evidence of Medieval bridges to support his argument that in the period from the Dissolution of the monasteries until the 1700s the increasing trade and mobility was based on changes to an already integrated and sophisticated system of Medieval roads (Harrison 2004: 230). The evidence for County Durham supports his assertion that the roads were an integrated system well before the Industrial Revolution, and indeed this thesis has shown that for County Durham the network had its origins in the first comprehensive national road system, the road network developed by Romans.

In addition to the road network County Durham also had a system of supporting routeway networks which have been shown in this thesis to develop and expand from 1530 to 1730, thus Harrison's picture of a substantial road system during this period was still not enough in Post Medieval County Durham to serve the county's growing economic and industrial needs. The road system therefore was augmented and complimented by the different transport networks such as the drove routes, lead routes and waggonways.

The assumption that some of these developing network types were inferior to a 'road network' is shown by Muir's statement that: " *The high profile of this form of transport* [packhorse routes] *in the region* [the north east] *until little more than a century ago was testimony to the severe inadequacies of the land transport network…"* (Muir 2006: 193). This thesis has argued, however, that the imperative for change to County Durham's transport network was not a regional imperative until later than other areas due to the fact that the different forms of land transport formed an integrated system within the County during the period 1530-1730, with the different networks serving different needs.

This holistic transport network which was developed and created in County Durham in the period 1530-1730 has been shown to have helped to drive new aspirations and aspects of consumption, facilitated the exchange of information and fashions and helped to provide new sources of wealth. The connectivity that the roads and routeways brought created a county with greater geographical, cultural and social knowledge that stimulated an increase in aspects of class consciousness, in so doing they also provided the means by which these new ideals and ideas could be expressed.

In the execution of the GIS, the quantitative spatial analysis, the trial dating study, the consideration of factors such as aspects of consumption, shifts in population and funding mechanisms and the investigation of the identities of those who used them this thesis has provided a holistic consideration of the roads and routeways as individual and integrated networks over a broad time period and challenged the criticism that, *"Writers on this topic have largely confined themselves to looking at the travellers, road maintenance, the means and safety of travel and the state of the road."* (Hindle 1998a: 5). In the examination of all of the interconnected factors discussed in this thesis the roads and routeways of County Durham have been set in a social context as well as an economic one. This thesis has therefore demonstrated the validity of the social context explored through day-to-day occupation and social identity as well as through the practical considerations of usage. In so doing this thesis has shown that archaeologists are able to draw upon and to examine roads as both artefacts and cultural markers.

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Ref No. D/X 237/1-22 Deeds and related papers of messuages (later a coach manufactory) in New Elvet belonging to the Angas family of Newcastle on Tyne. Durham, Durham Record Office Deposit.

Ref No. D/X 409 Miscellaneous documents, Durham.

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Road and Routeways in County Durham: 1530-1730

Volume II

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Volume II of II Volumes

Roads and Routeways in County Durham: 1530-1730
Volume II

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10 Selected Glossary

Bouse: Ore bearing material.

Carrier: Person employed in the carriage of goods (alternate words include: waggoner, carter).

Chapman: Itinerant trader (alternate words include: badger, cadger, and pedlar).

Galena: Lead sulphide ore

Galloway: Breed or type of horse commonly used as pack animal in Northern England (alternate words include: galloway, gallowa and jagger pony).

Grid: An item that stores spatial data in a locational (or raster) format in which the grid is divided into squares or cells, and each cell stores a numeric data value e.g. relating to slope. Grids are less accurate for modelling terrain than TINs. They are however quicker to generate, smaller in save space and therefore versatile.

Jagger: Usually used to refer to the person accompanying the horses but sometimes used to refer to horse.

Map Calculator: A tool enabling the mathematical manipulation of the data in the GIS

Map Query: A tool enabling the selection/isolation of different features in the data in the GIS

Metalling: The use of materials such as stone to produce a surface for a road.

Pack Saddle: Rigid structure, often wood but sometimes pads filled with straw.

Pannier: Basket or pouch often wicker or net hung either side of the horse. Also used to refer to boxes or barrels.

Stoop: Guide post on packhorse route (words include: stob, stub, and stump).

TIN: A Triangulated Irregular Network model divides a surface into a set of adjacent, non-overlapping, triangles. A height value is recorded for each triangle intersection or node. Heights between nodes can be calculated and a continuous surface formed.

Raster Data: Data recorded in a regular grid.

Viewshed: A viewshed analysis identifies the cells that can be viewed or seen from a defined observer location and height.

11 Time Line

11.1 Key points in time for the roads, 1531-1747

1531: The Statute of Bridges gave each county the power to raise taxes for the repair and maintenance of the bridges

1555: The First Statute of Highways, also known as the Highways Act. Responsibility for the upkeep of the roads was placed on the parishes, through a system of labour provided by the parishioners.

1563: Amendment to Highways Act 1555 which increase the amount of labour that the parish can request to six days.

1635: The Royal Postal service is available for use by the public

1663: The first Turnpike Act was granted for part of the Great North Road

1706: The first Turnpike Trust established.

1700-50: Nationally around 10 turnpike trusts set up each year.

1747: The first granting of the rights for a turnpike in County Durham.

12 Figures

12.1 Illustrations for General Reference

Figure 1: Settlements in County Durham

12.2 Illustrations for Chapter 3: Methodology

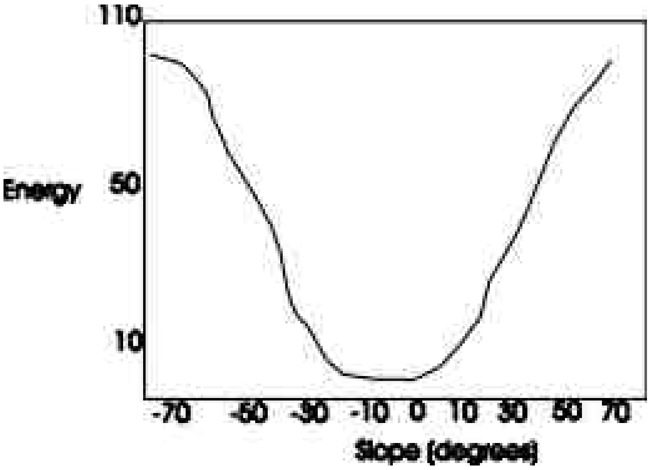


Figure 2: The relationship between energy and slope.

After Llobera 1999. Showing that a slight downward incline requires the least energy.

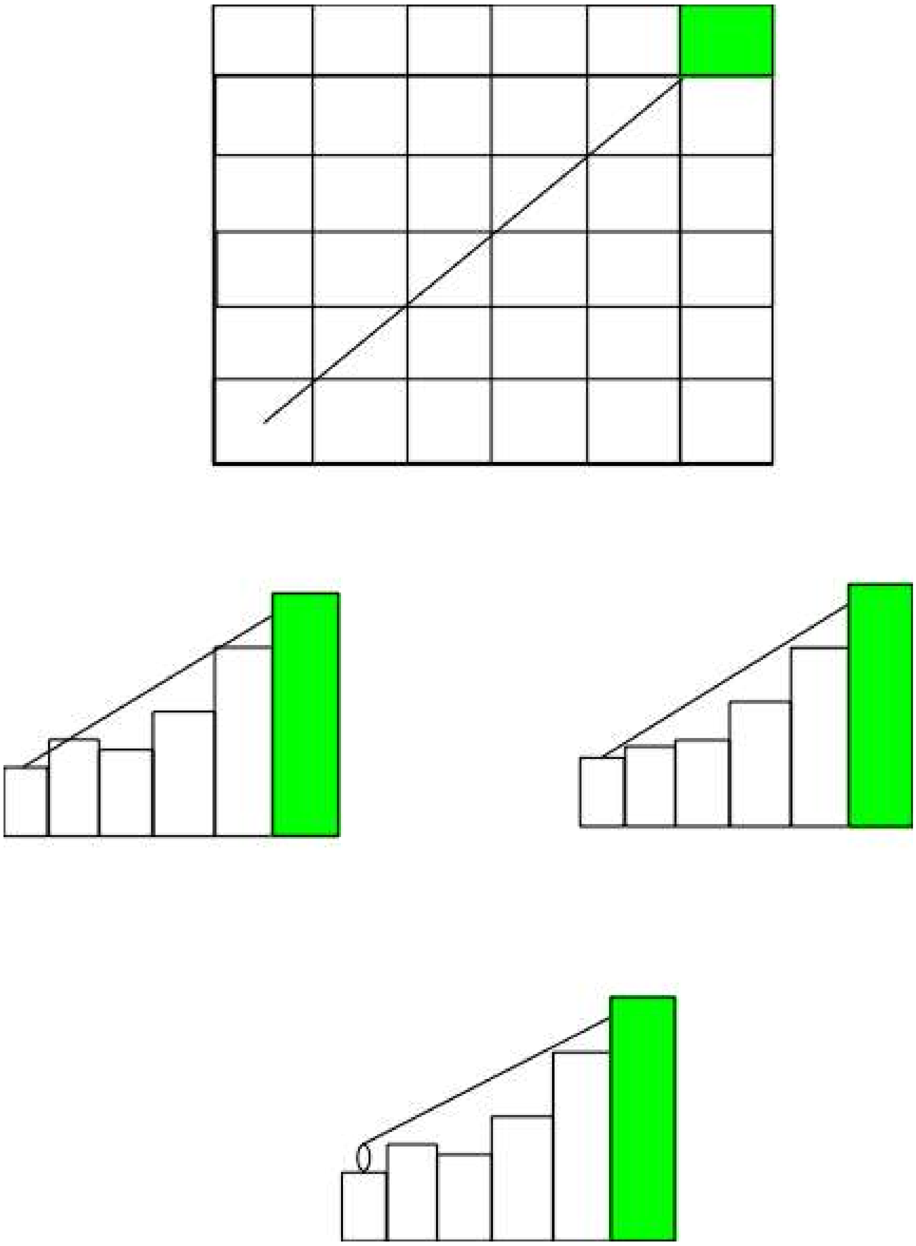


Figure 3: Line of sight illustration

A schematic illustration of a line of sight calculation. If the heights of the intervening cells do not cross this line then there is a line of sight, as seen in the second side elevation and the third side elevation where height has been added to the target cell; however as with the first side elevation example above if the height of any cell does exceed the height of the line then there is no line of sight

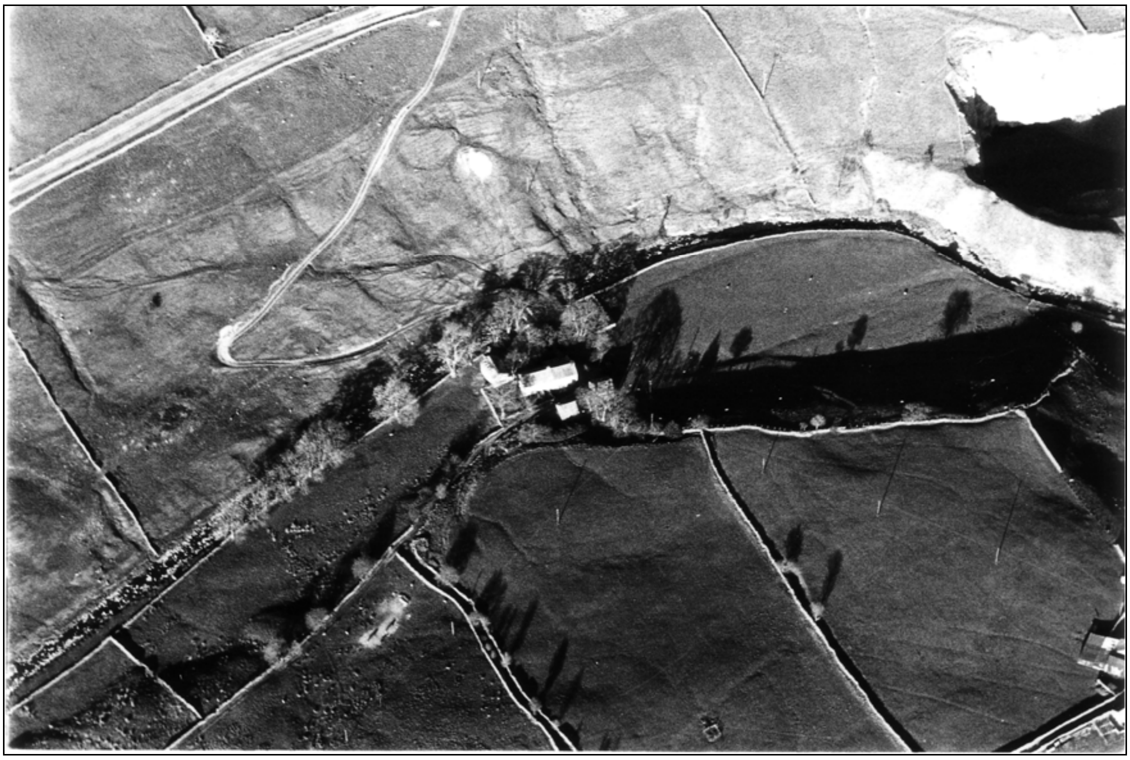


Figure 4 Aerial Photograph of Low Allers.

For the Aerial Photograph Classification see Appendix 1

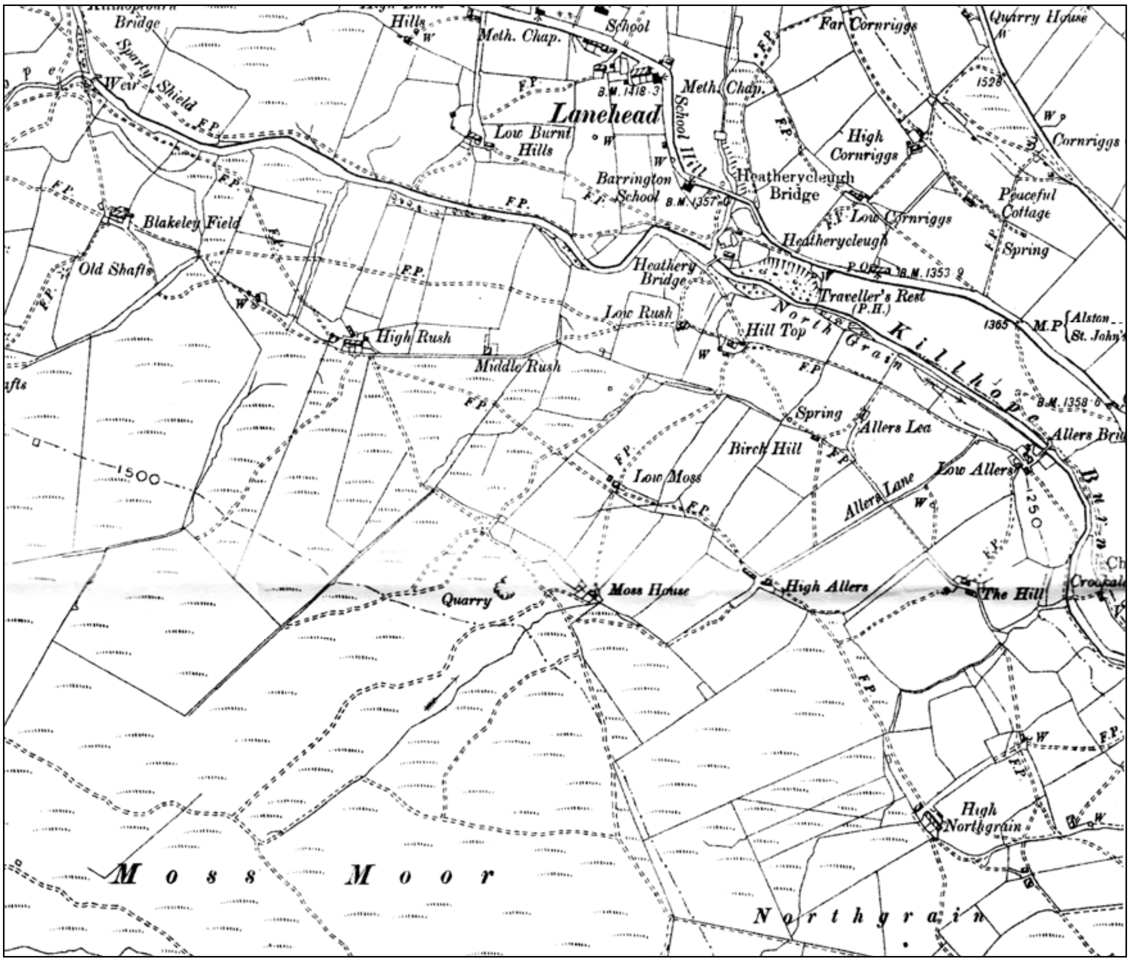


Figure 5 Low Allers (Co. Durham) from the 1896 OS map

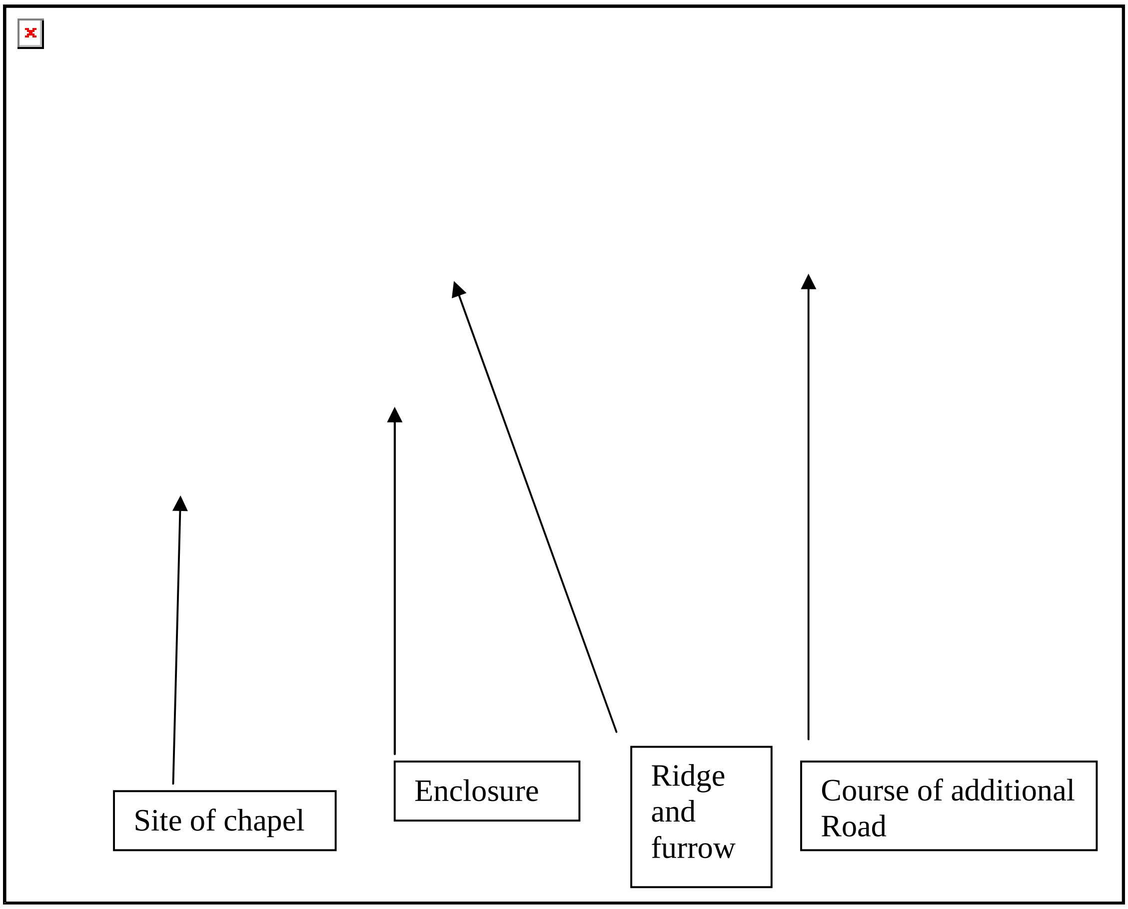


Figure 6 Esp Green

(Source: Archaeological Services University of Durham (ASUD) Negative 13/2)

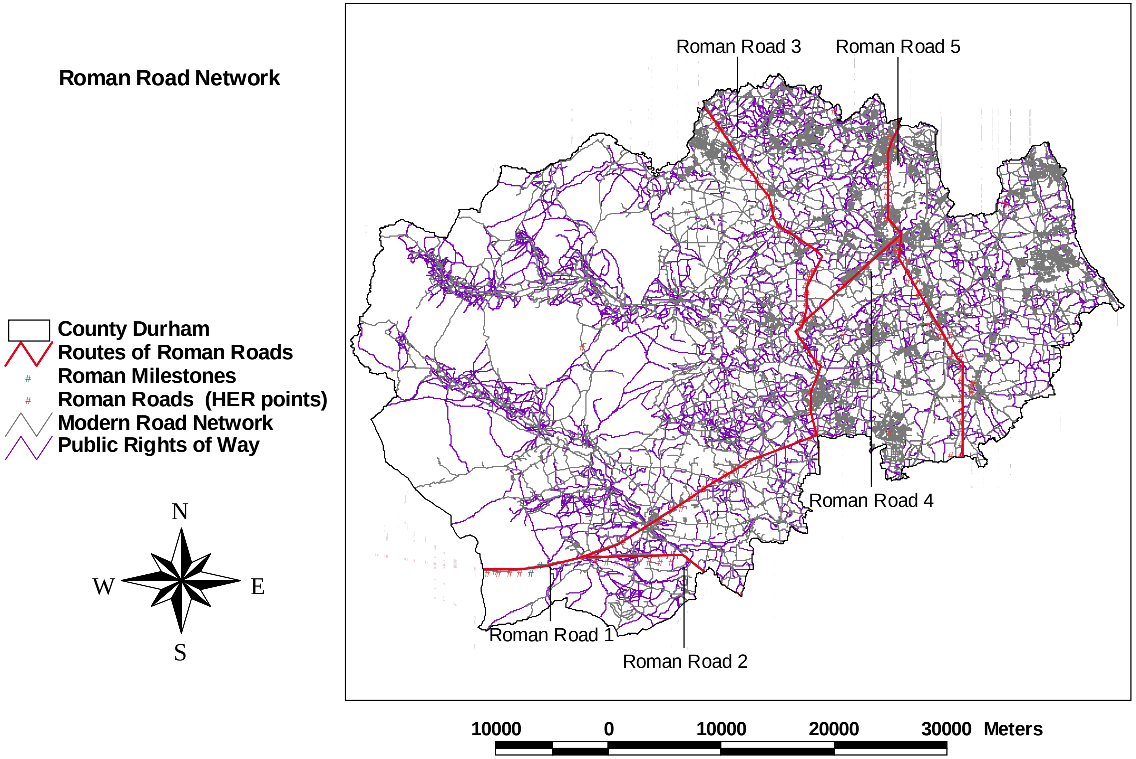


Figure 7: Locations of the Roman Roads, Milestones and Roman HER sites along the courses of the roads.

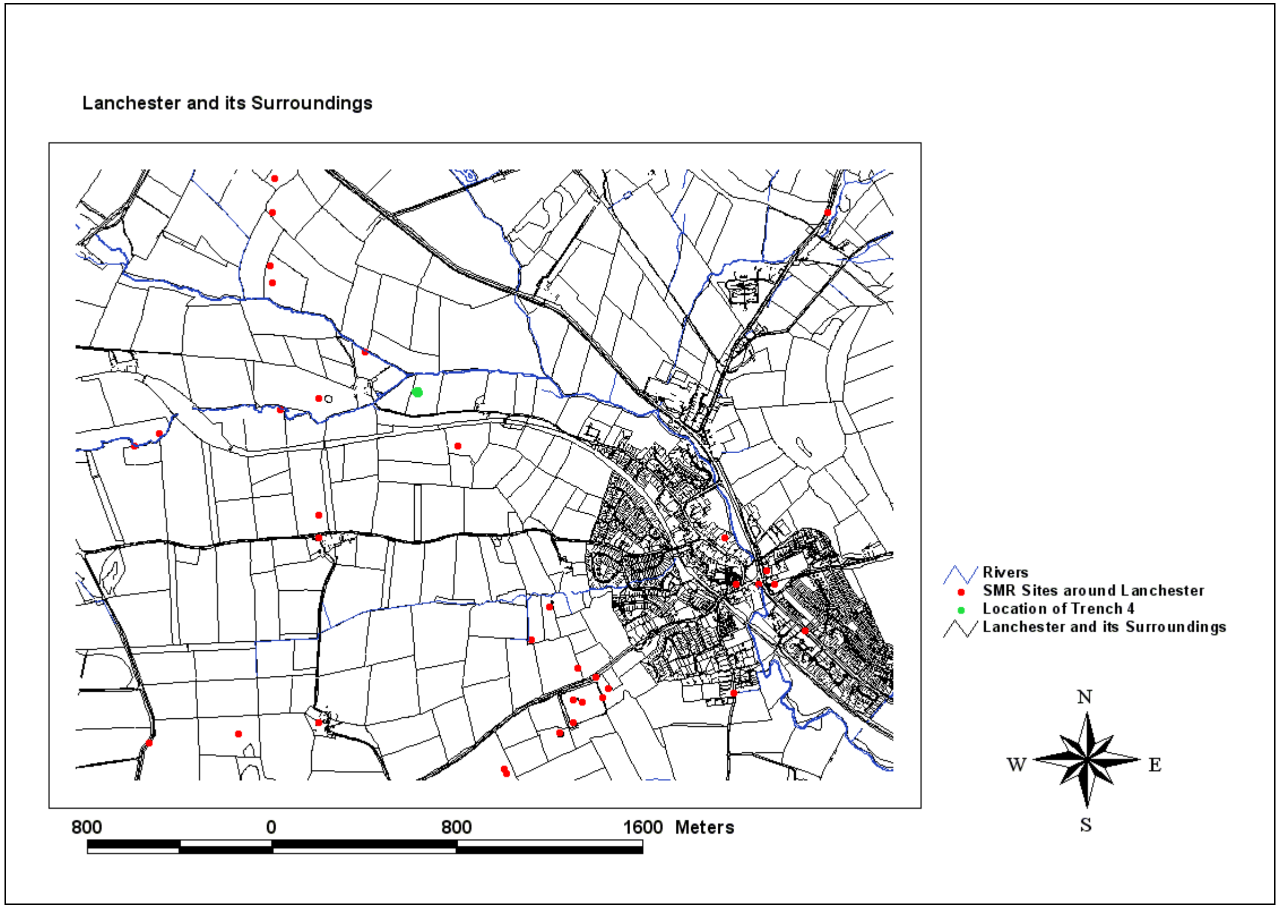


Figure 8 Lanchester and its Surroundings

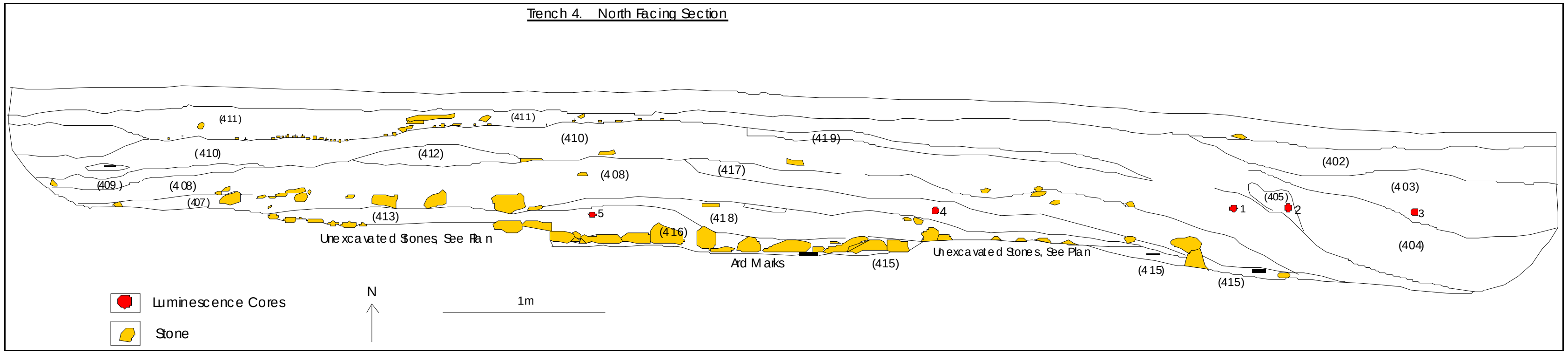


Figure 9: Lizards Farm Trench 4 North Facing Section

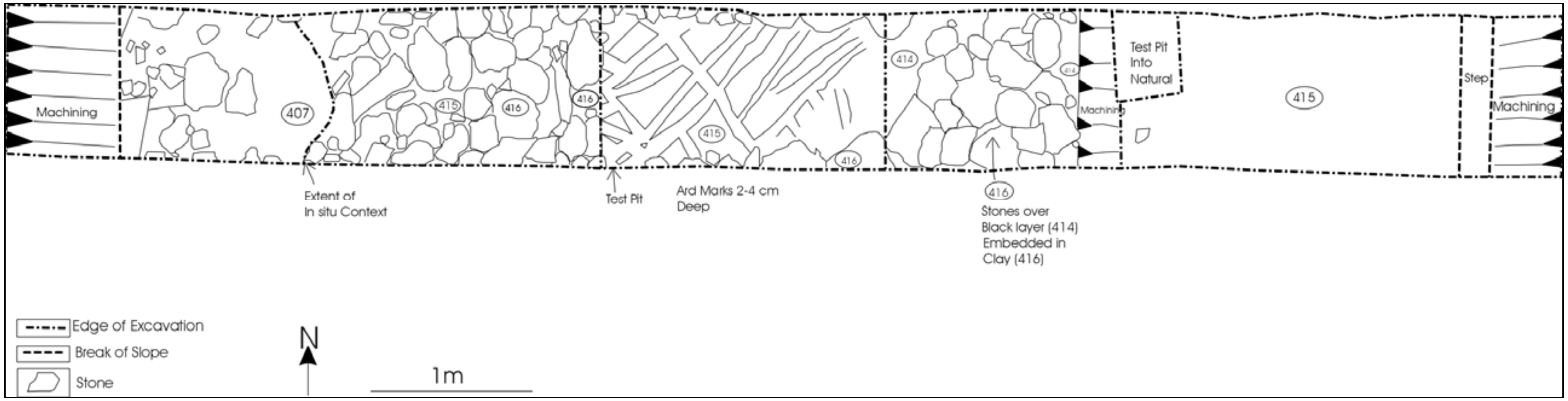


Figure 10: Lizards Farm Trench 4 Plan

Figure 11 Ard Marks found at the Dere Street Excavation

Figure 12: Vertical Core from the Dere Street Ditch

Photography by Jeff Vietch

12.3 Illustrations for Chapter 4: Re-Use of the Roman Network

12.3.1 Roman Roads

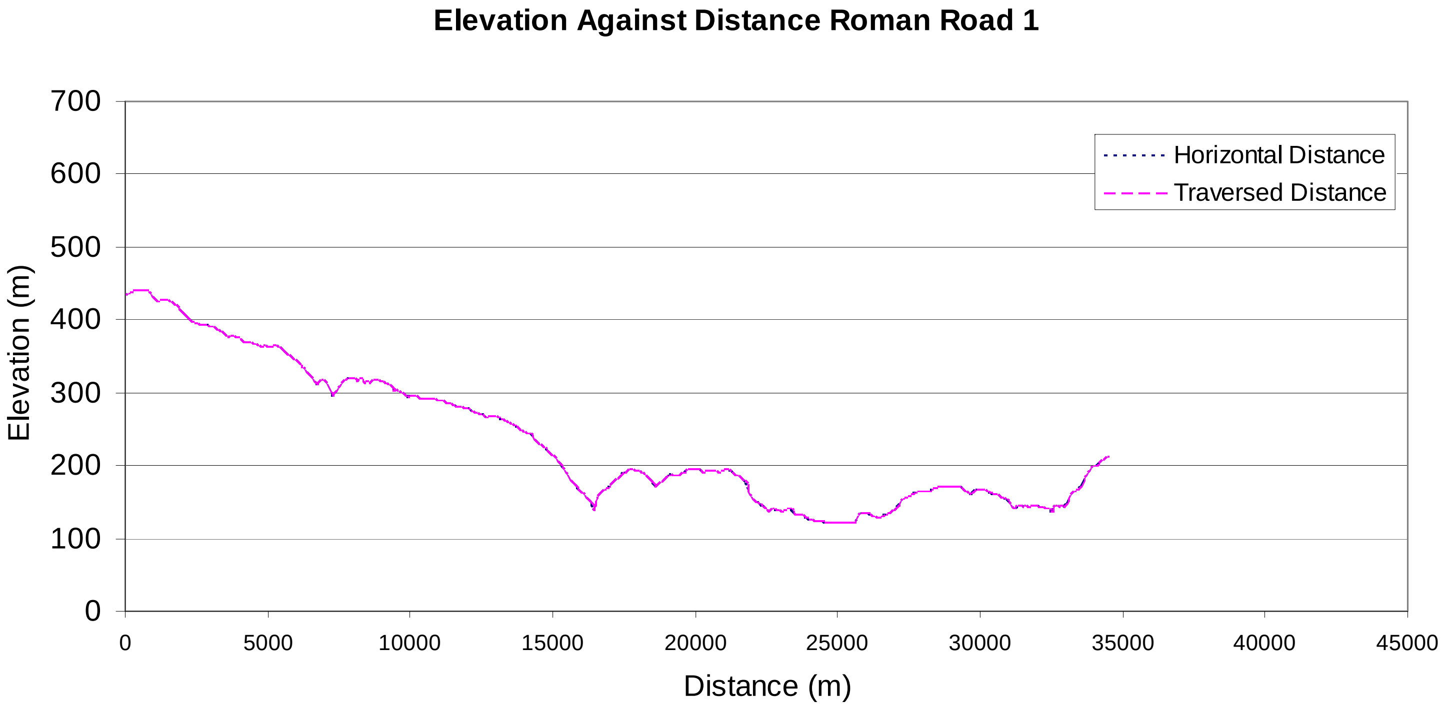


Figure 13: Roman Road 1: Elevation against Distance

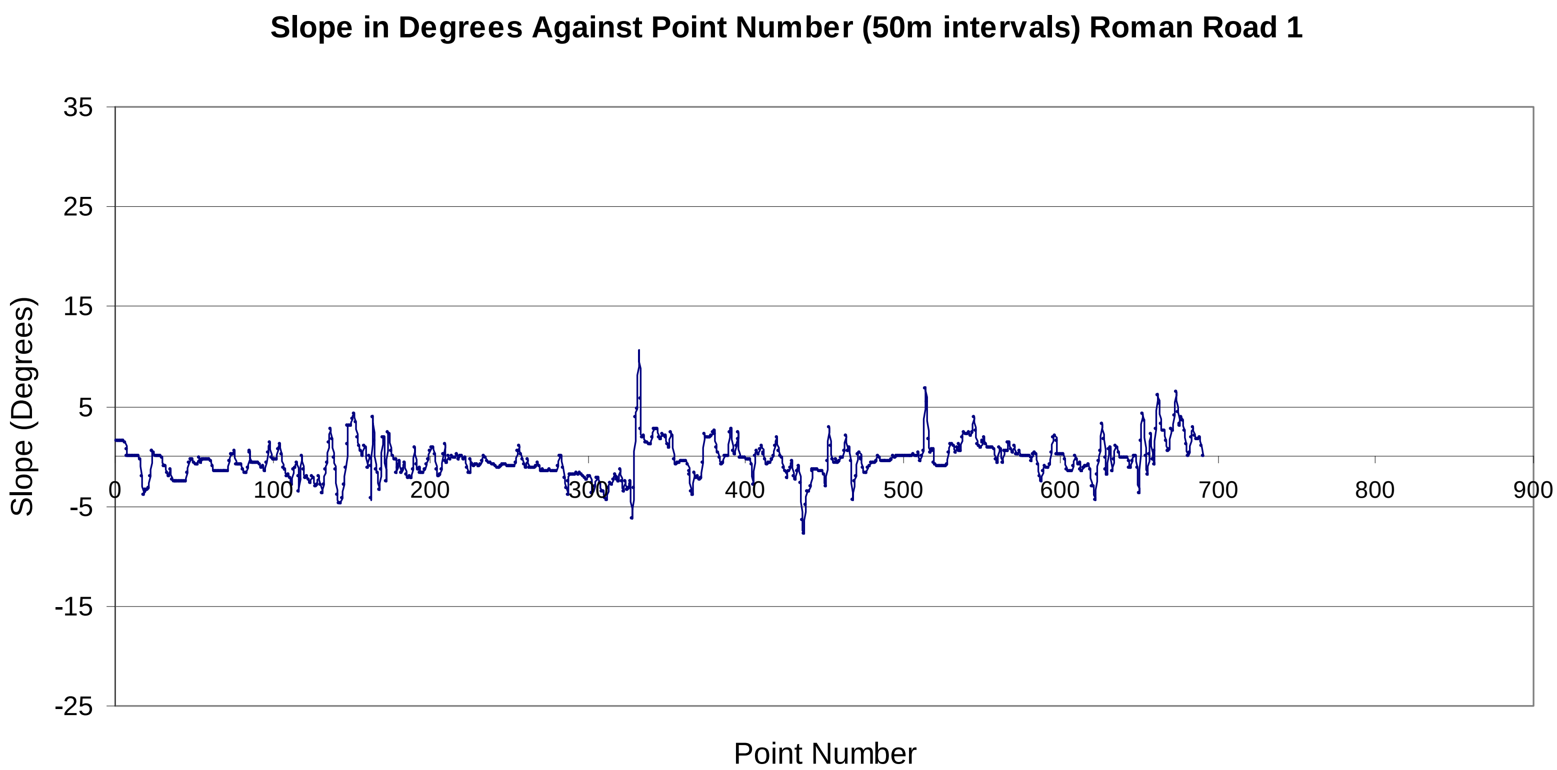


Figure 14: Roman Road 1: Slope in Degrees against Point Number

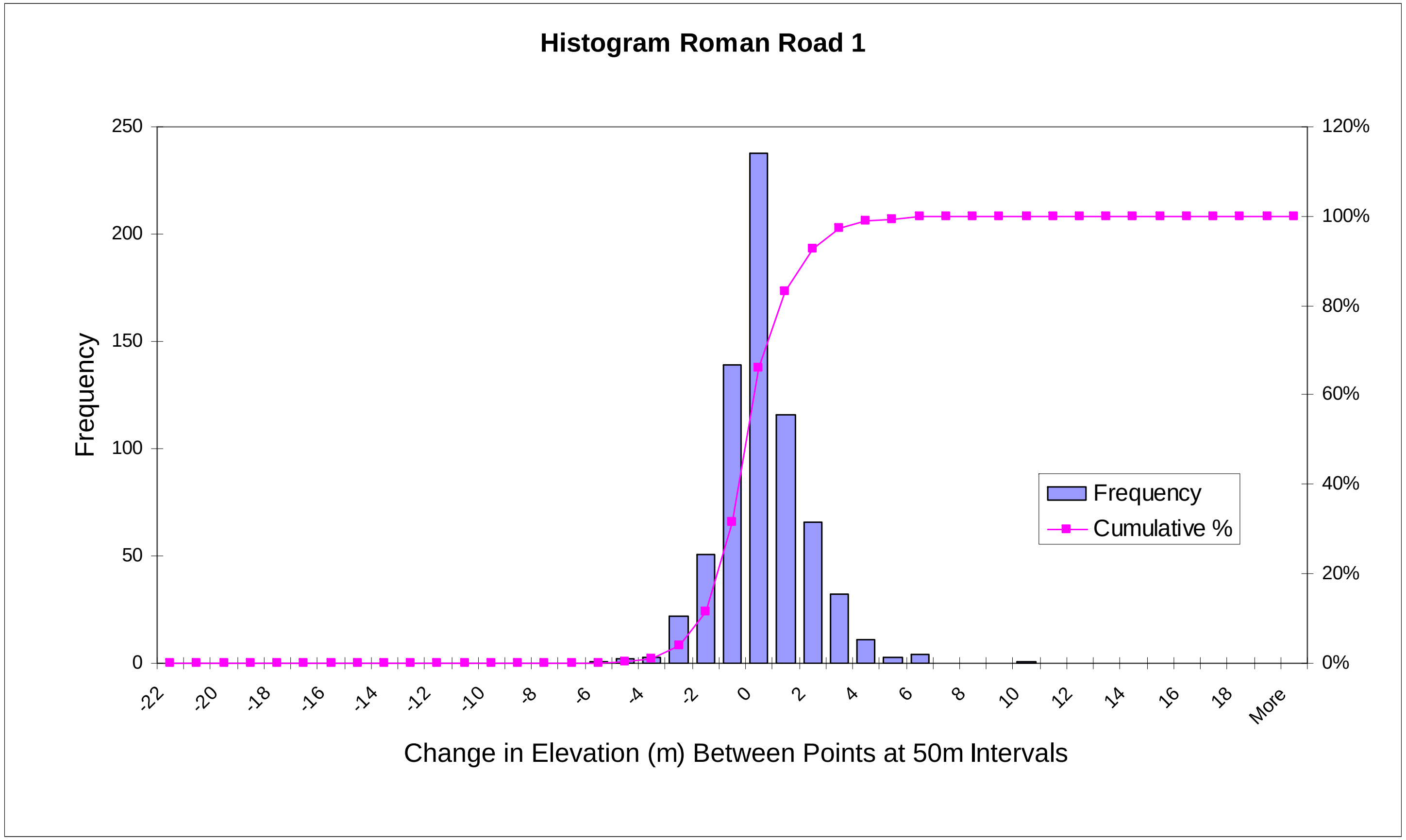


Figure 15: Roman Road 1: Histogram

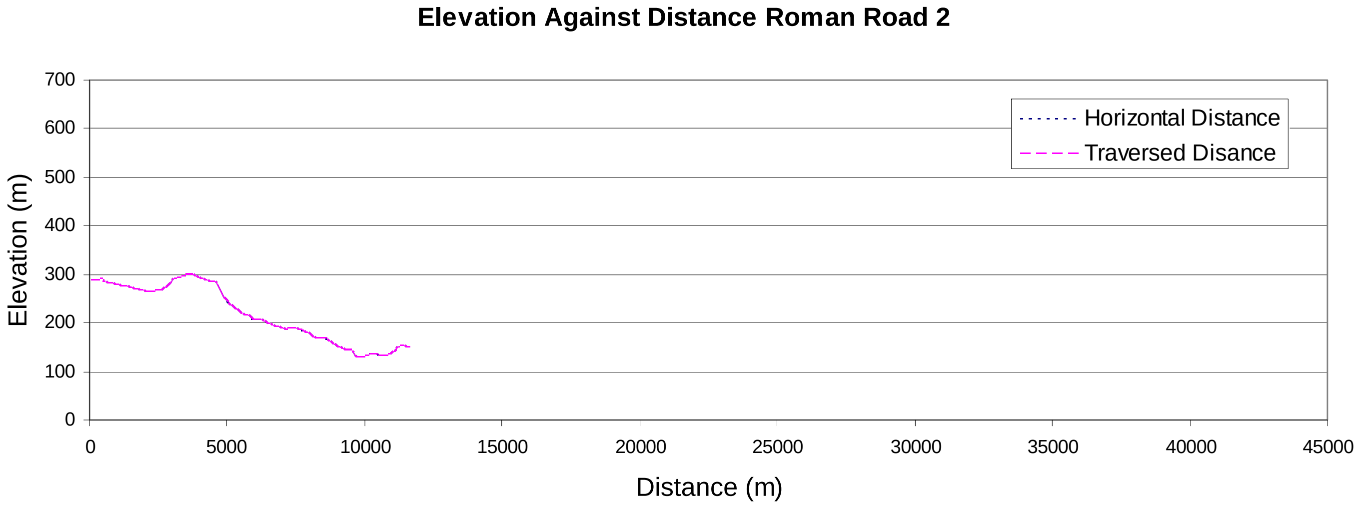


Figure 16: Roman Road 2:Elevation against Distance

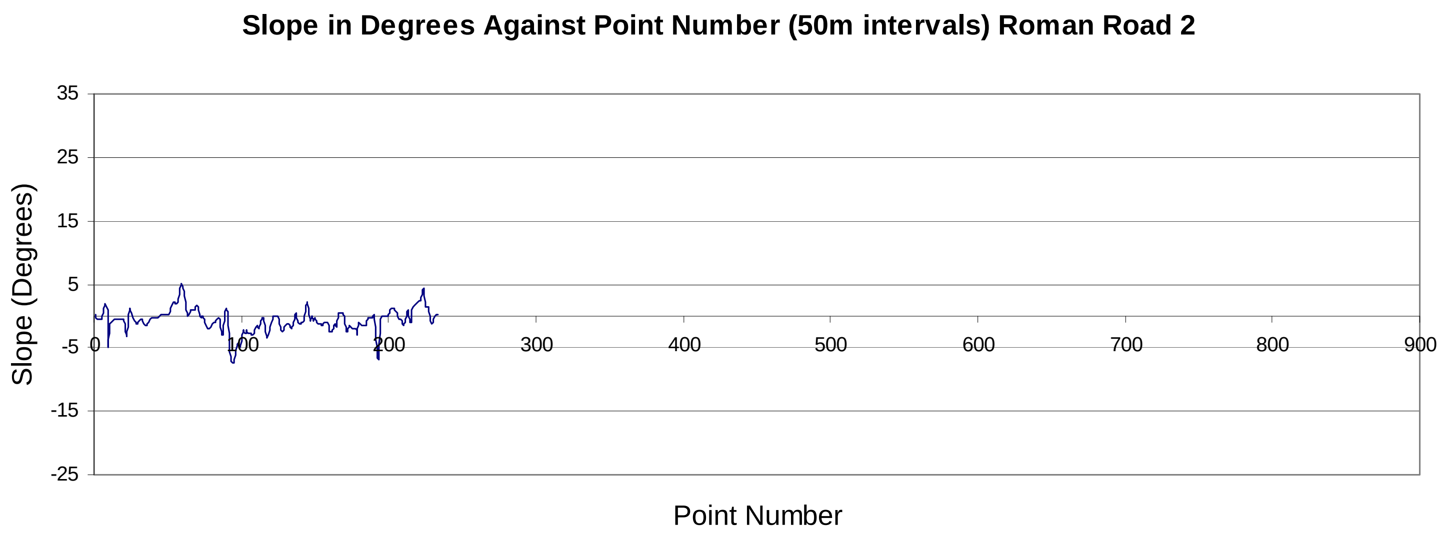


Figure 17: Roman Road 2: Slope in Degrees against Point Number

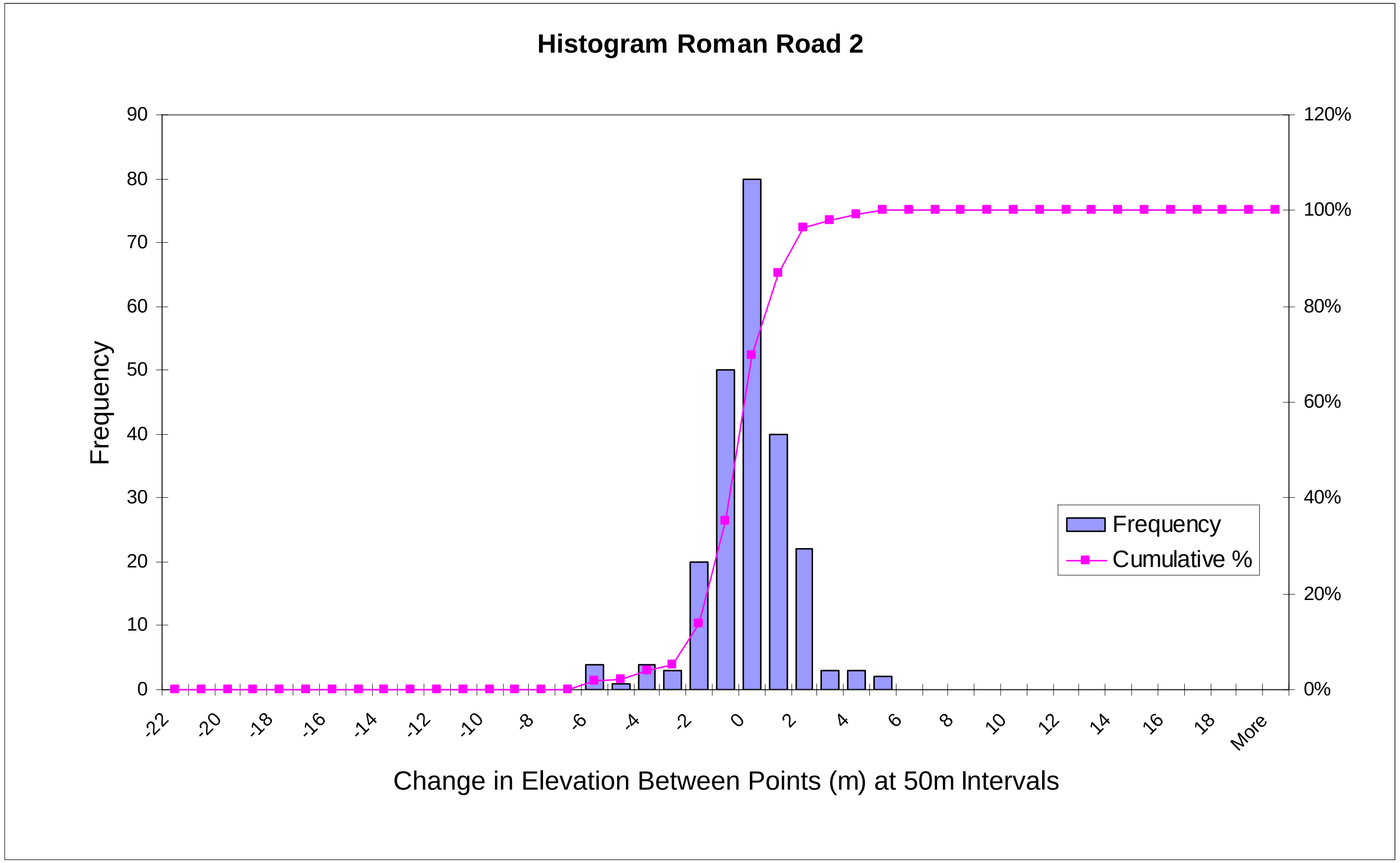


Figure 18: Roman Road 2: Histogram

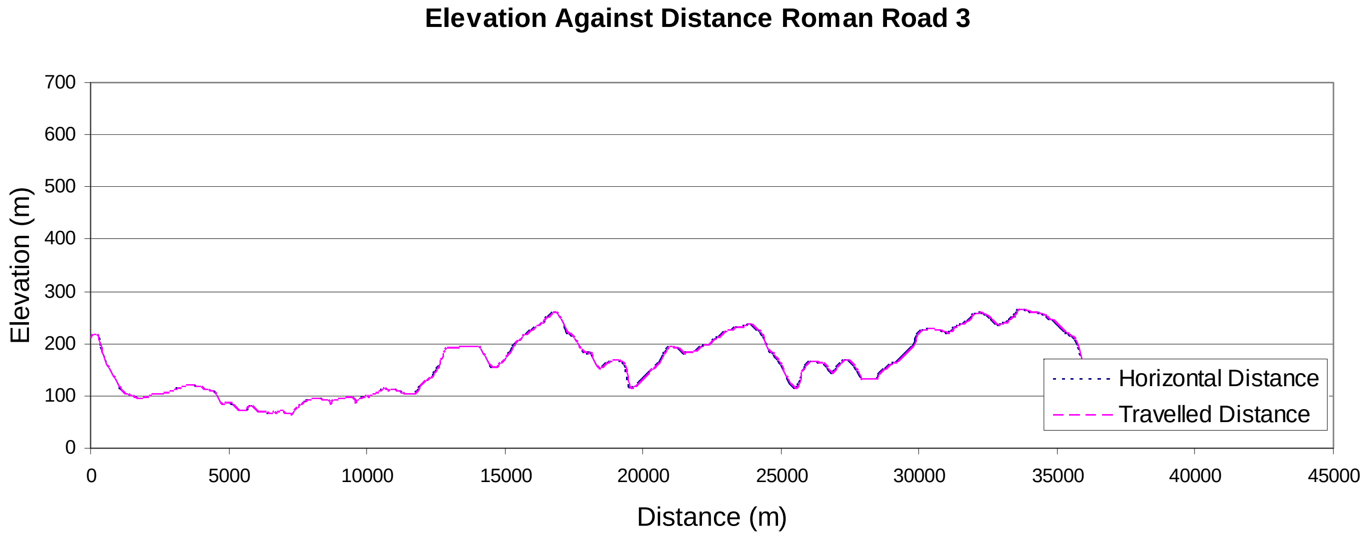


Figure 19: Roman Road 3: Elevation against Distance

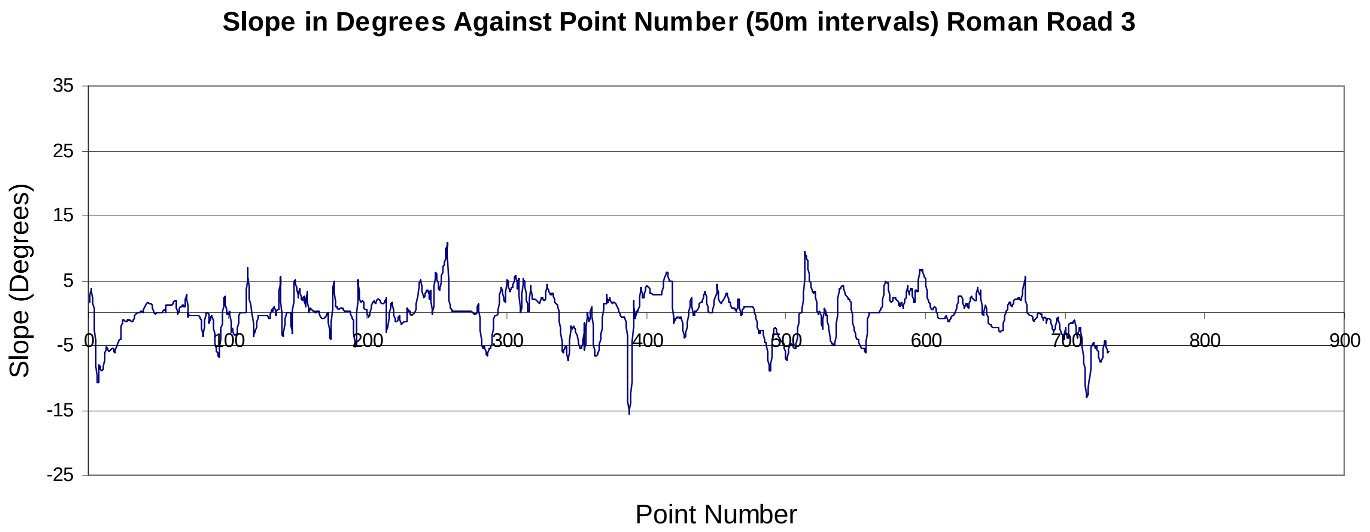


Figure 20: Roman Road 3: Slope in Degrees against Point Number

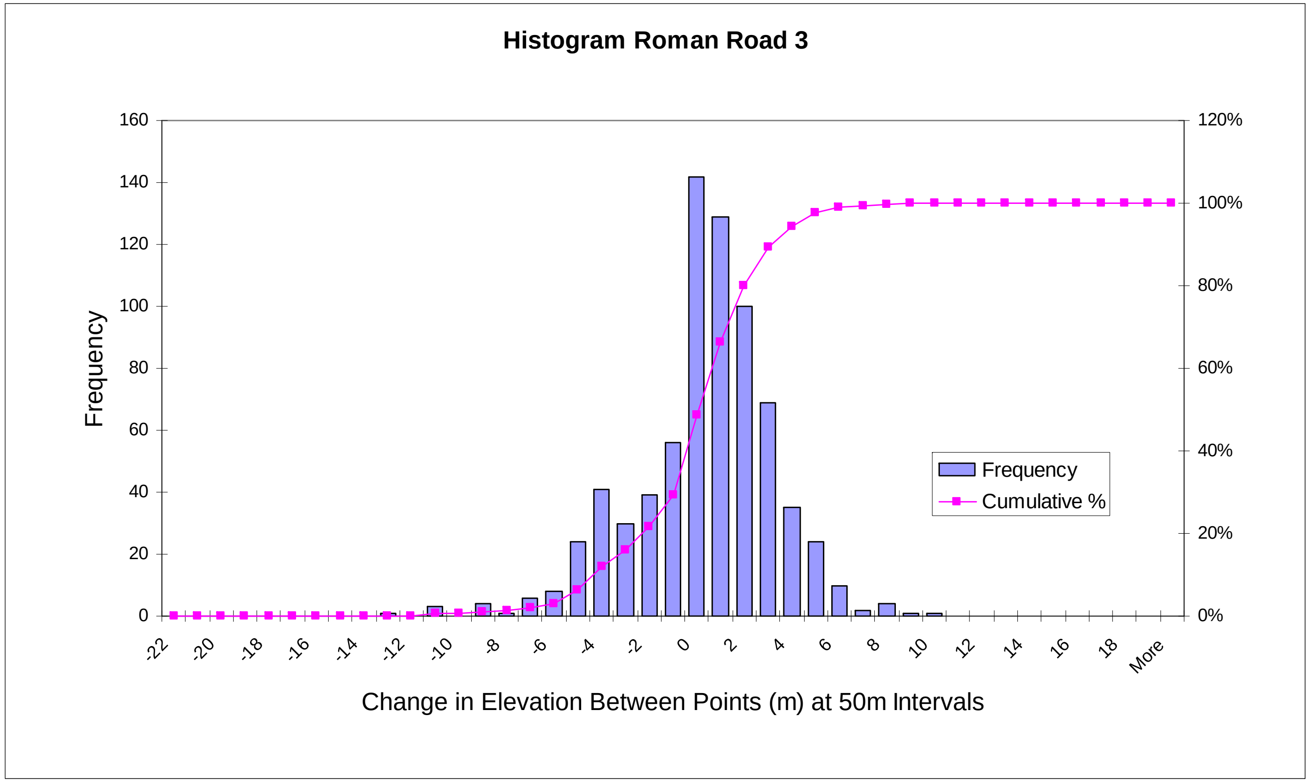


Figure 21: Roman Road 3: Histogram

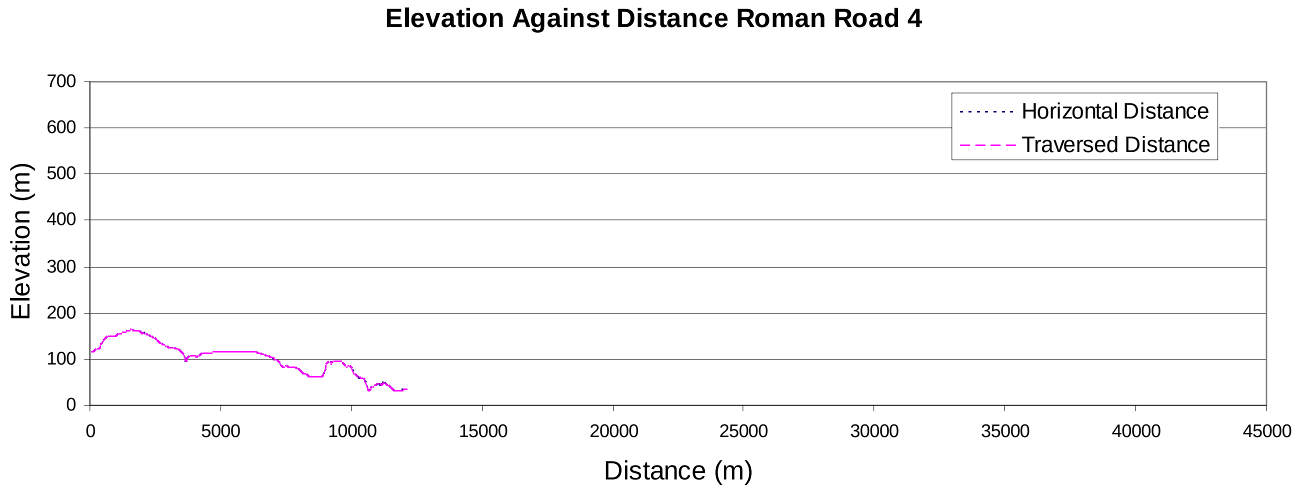


Figure 22: Roman Road 4: Elevation against Distance

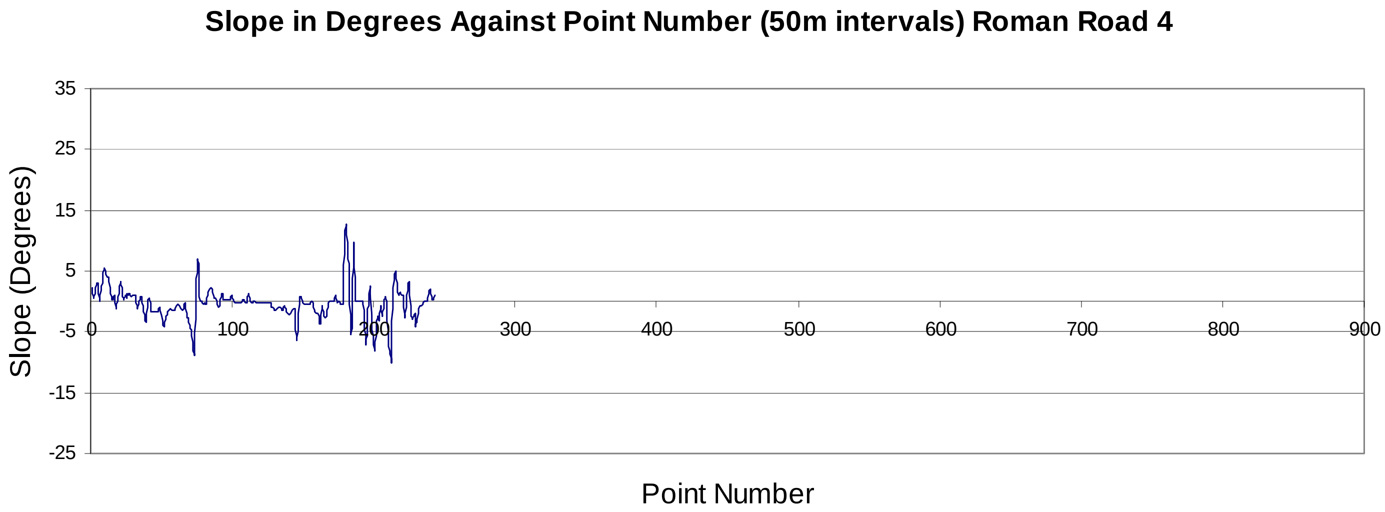


Figure 23: Roman Road 4: Slope in Degrees against Point Number

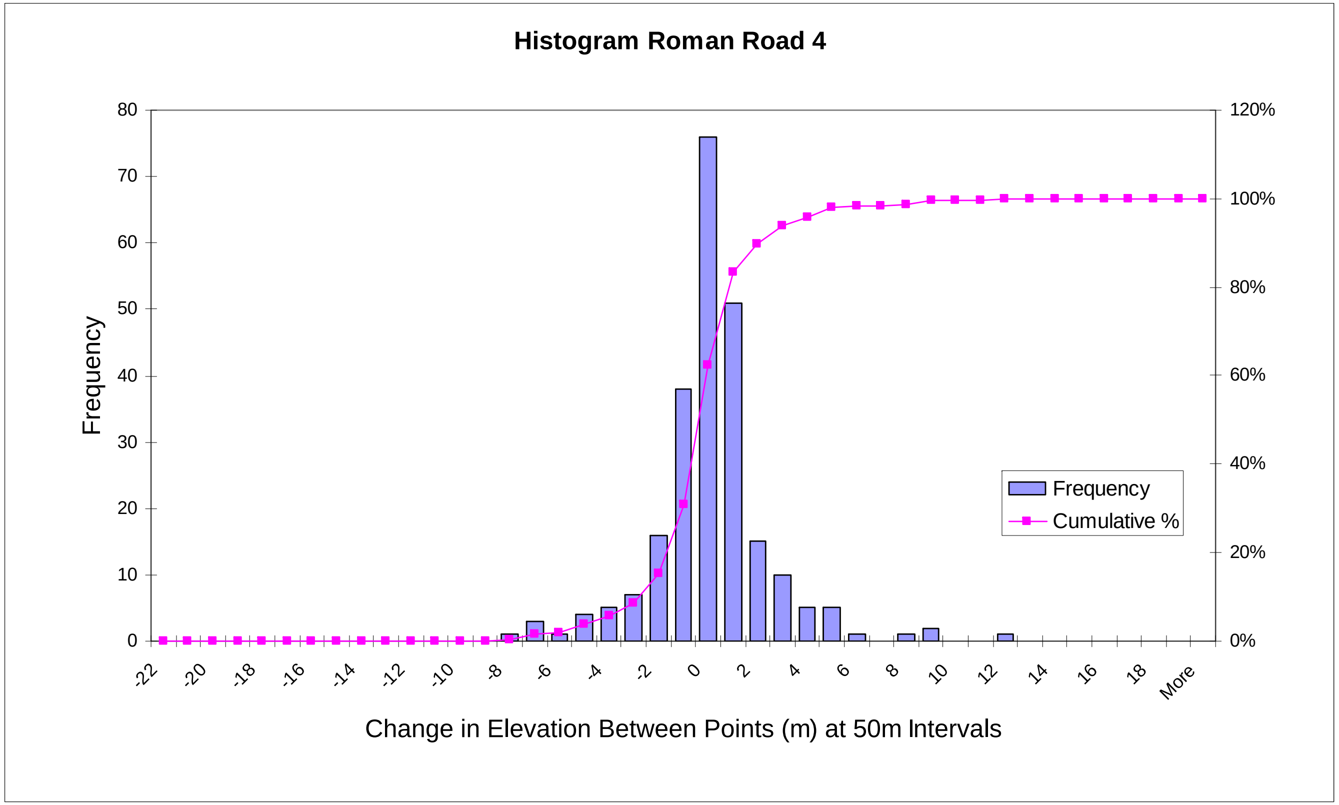


Figure 24: Roman Road 4: Histogram

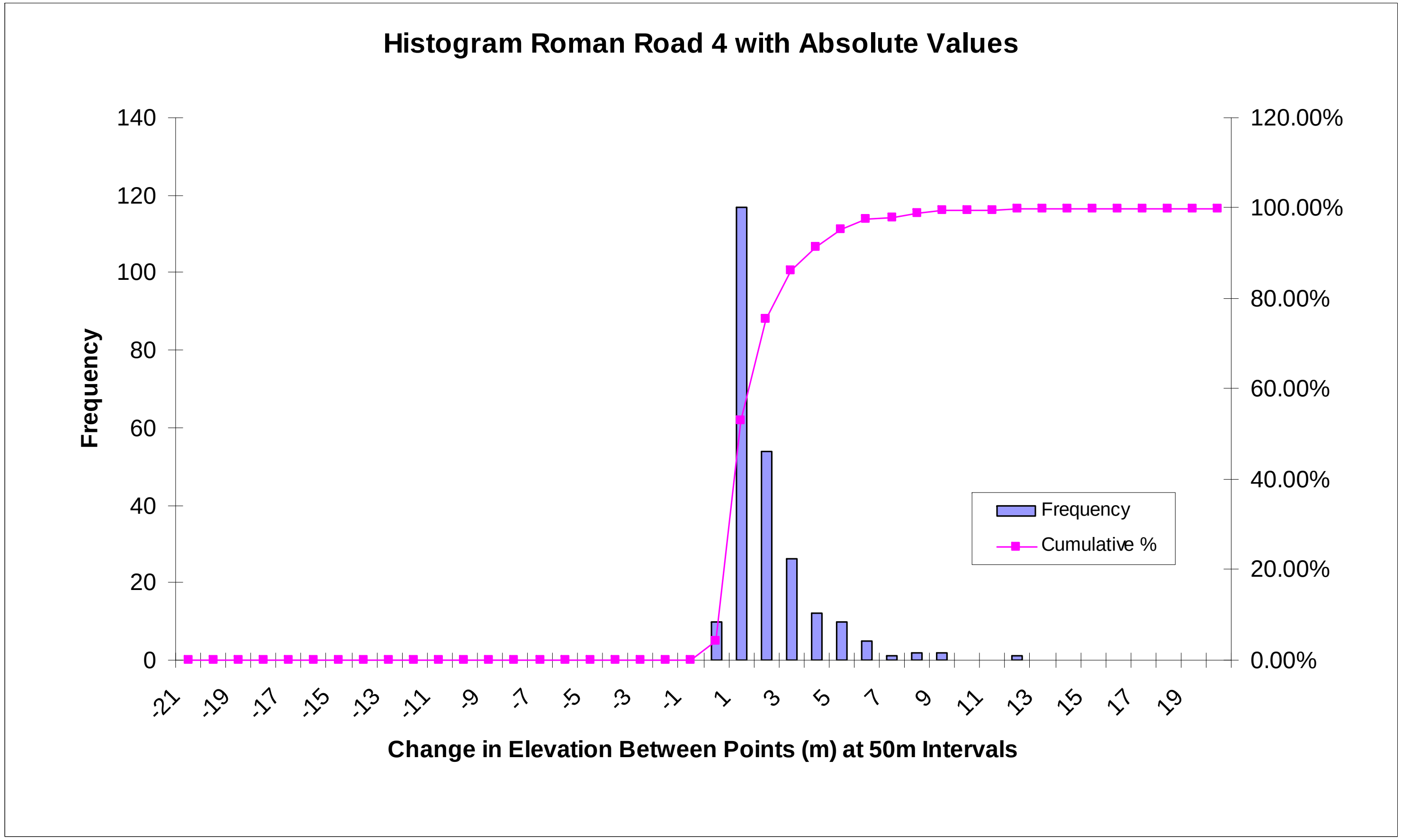


Figure 25: Roman Road 4 Histogram Absolute Values

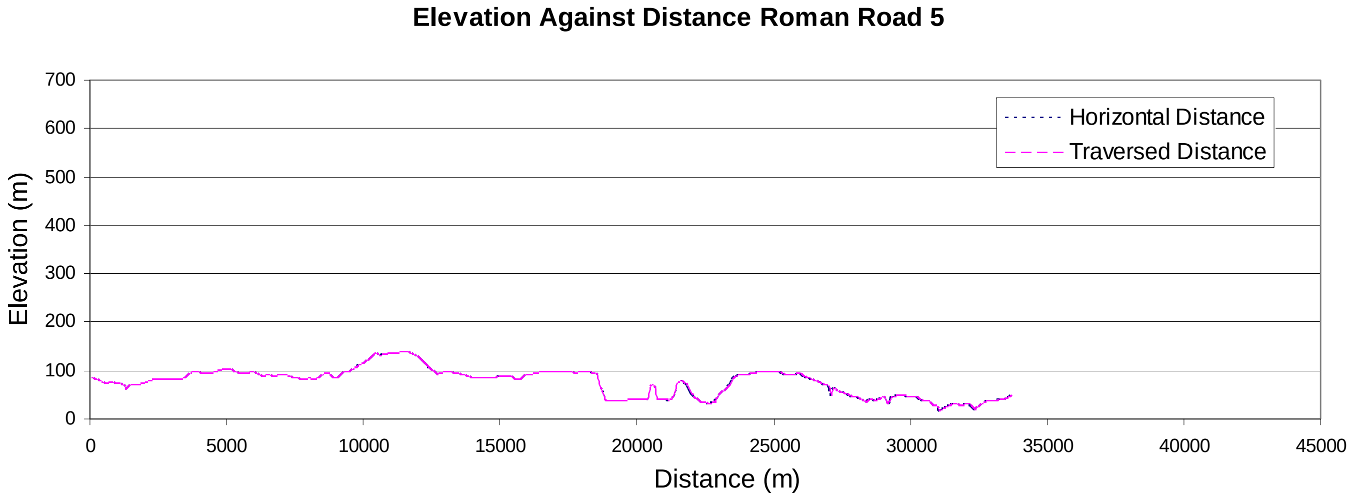


Figure 26: Roman Road 5: Elevation against Distance

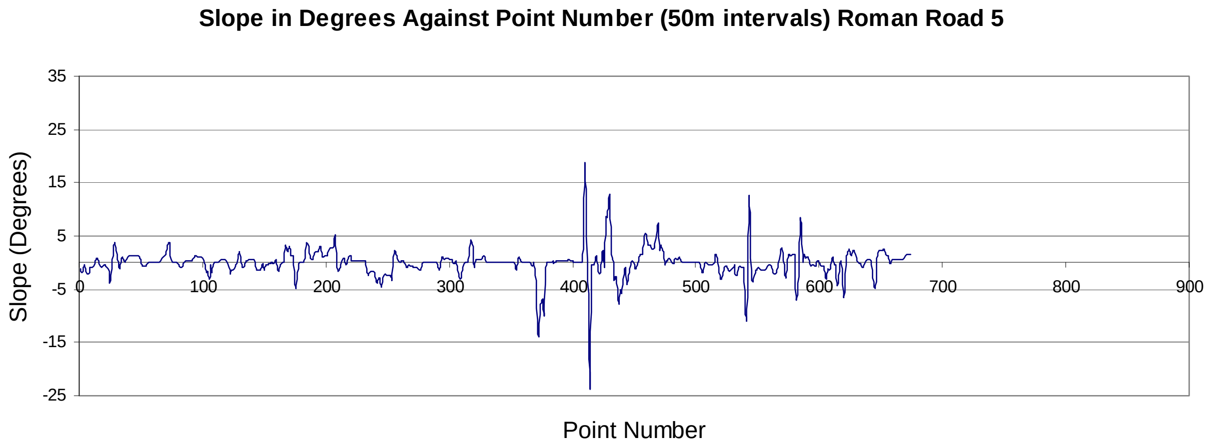


Figure 27: Roman Road 5: Slope in Degrees against Point Number

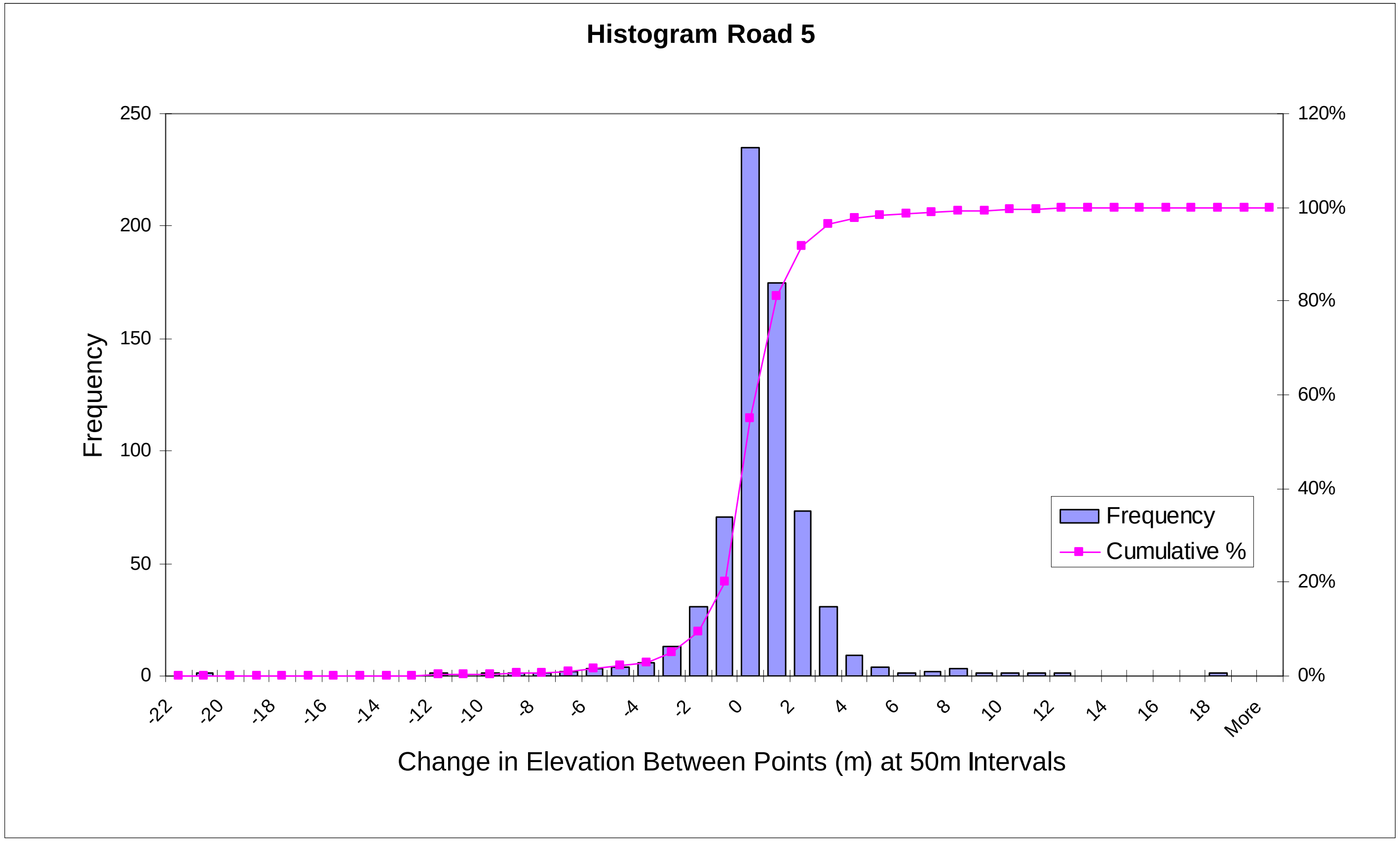


Figure 28: Roman Road 5: Histogram

12.3.2 Least Cost Routes of the Roman Roads

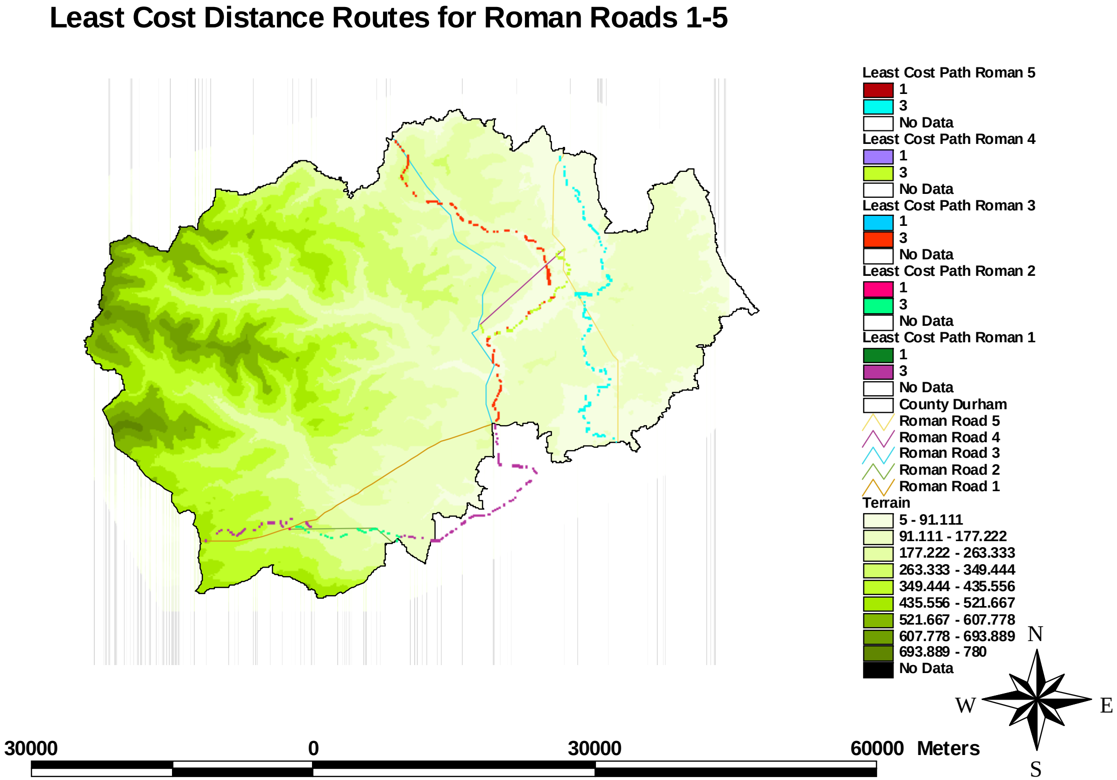


Figure 29: Least Cost Routes for the Roman Road

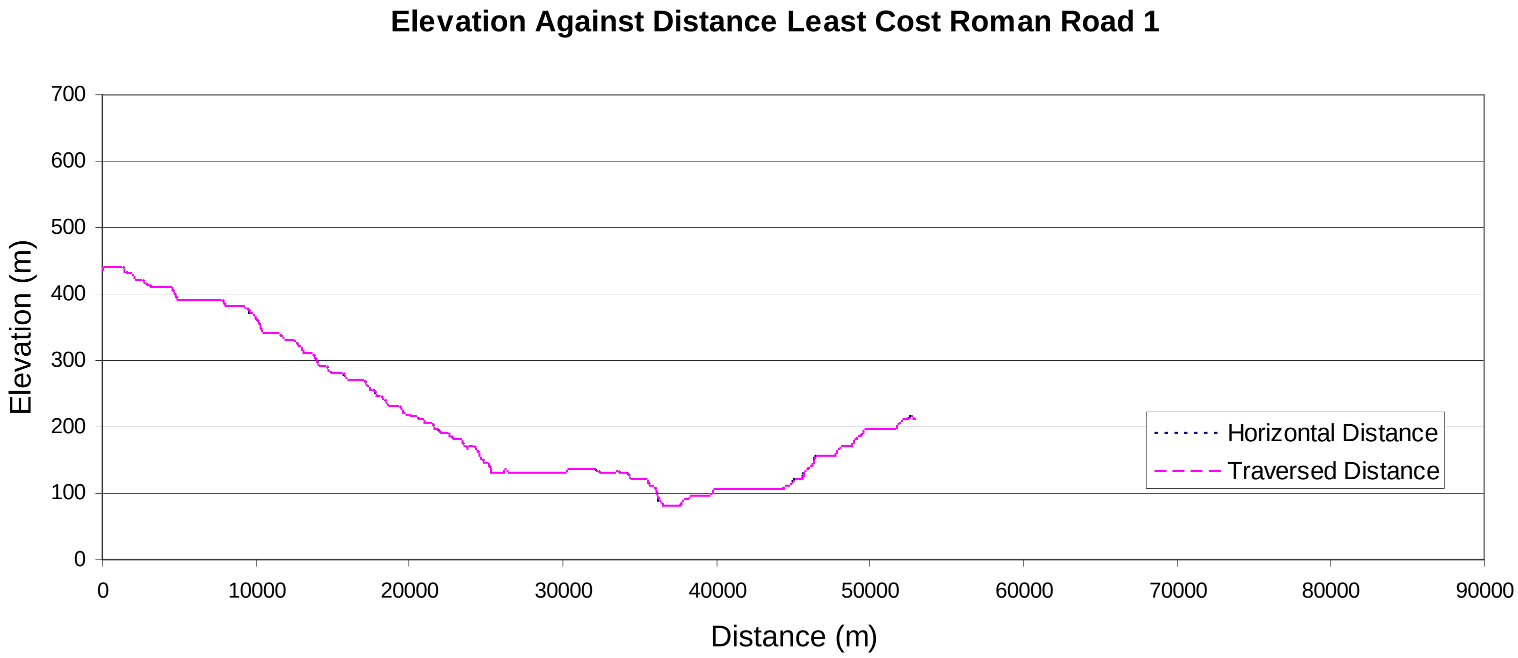


Figure 30: Roman Road 1:Elevation against Distance Least Cost

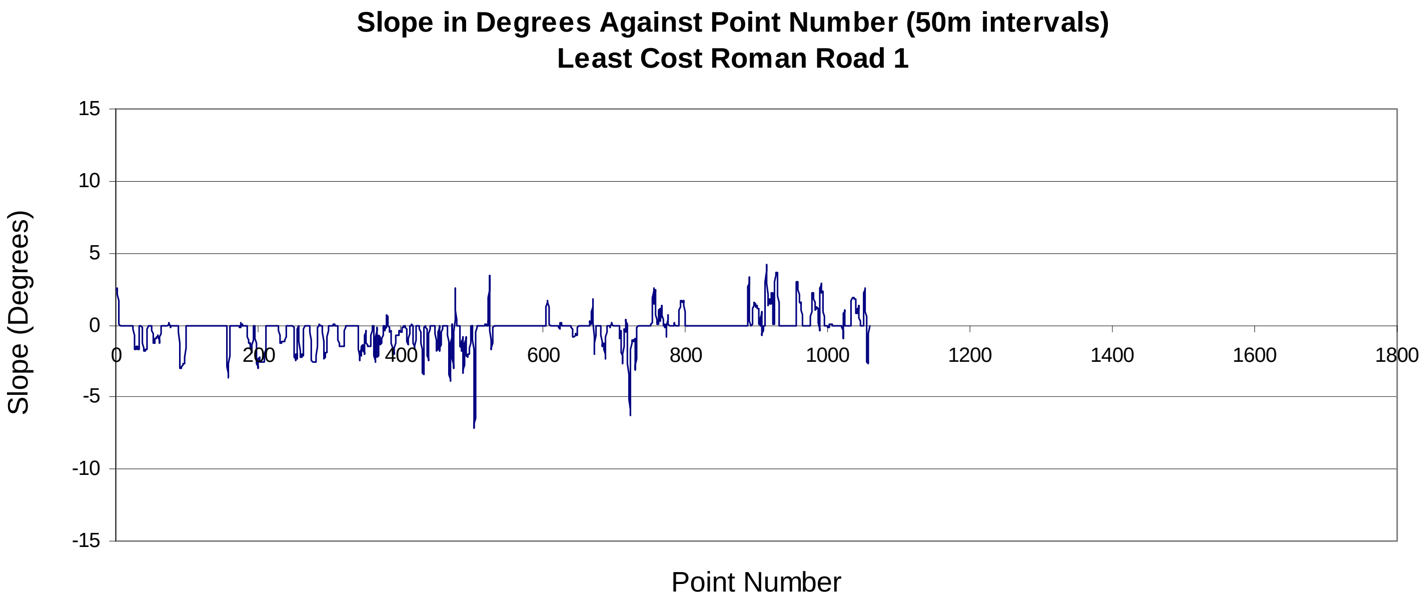


Figure 31: Roman Road 1: Slope in Degrees against Point Number Least Cost

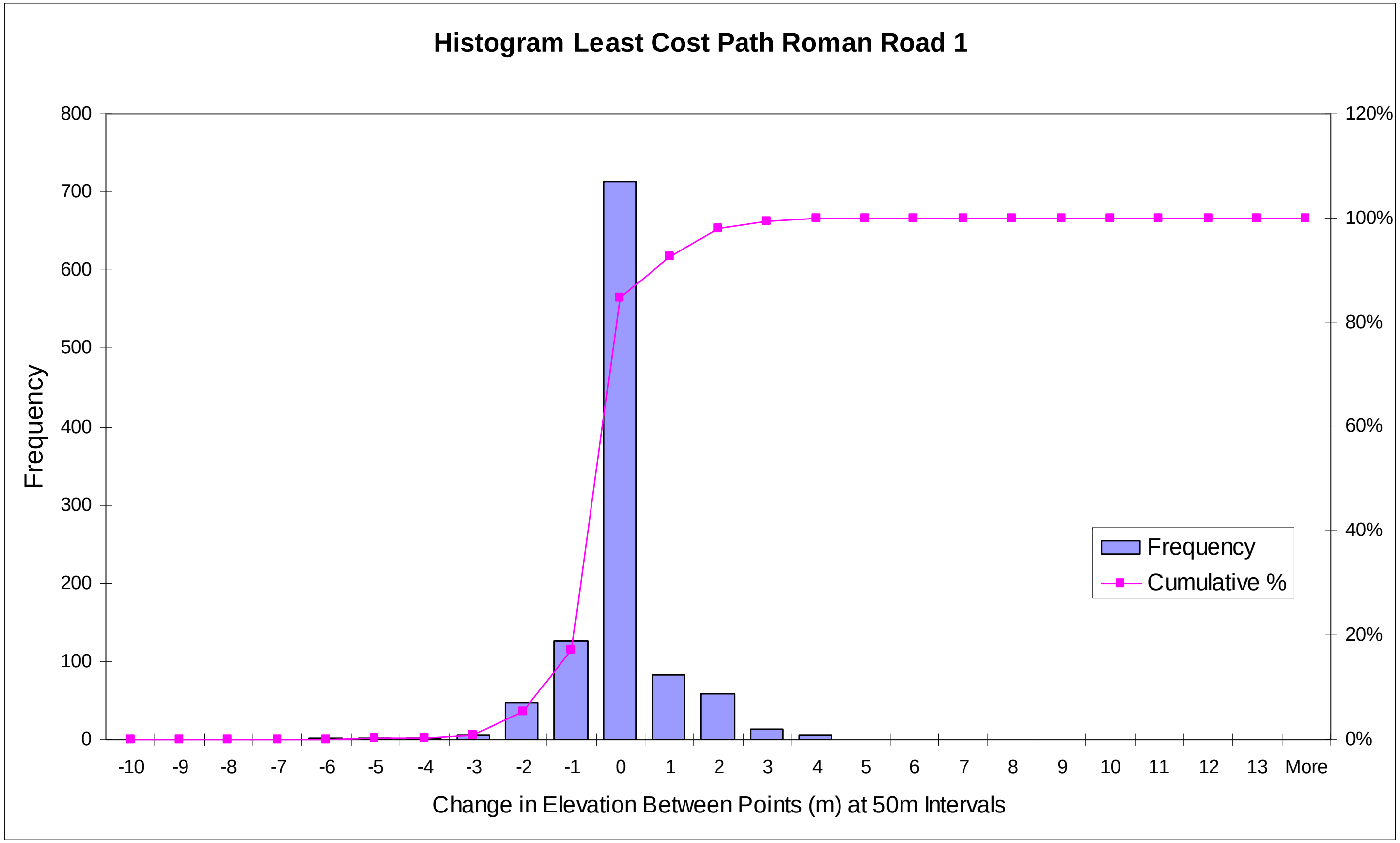


Figure 32: Roman Road 1: Histogram Least Cost

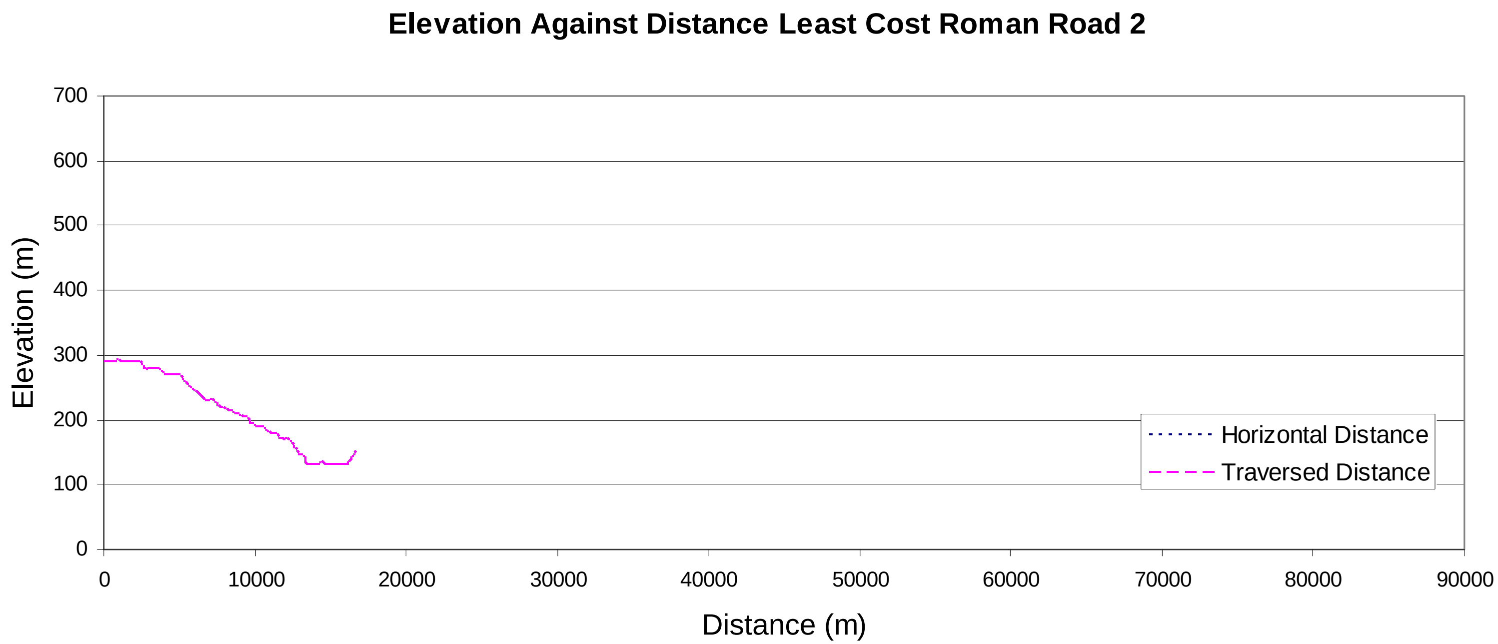


Figure 33: Roman Road 2: Elevation against Distance Least Cost

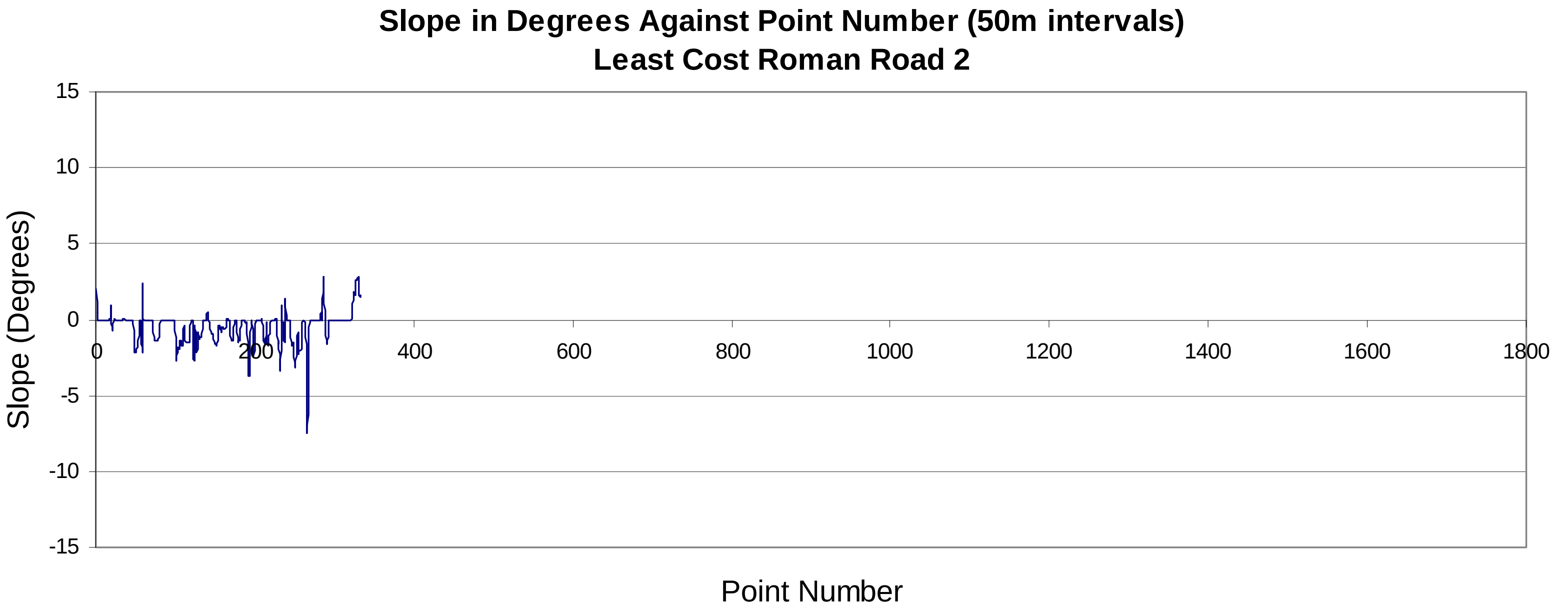


Figure 34: Roman Road 2: Slope in Degrees against Point Number Least Cost

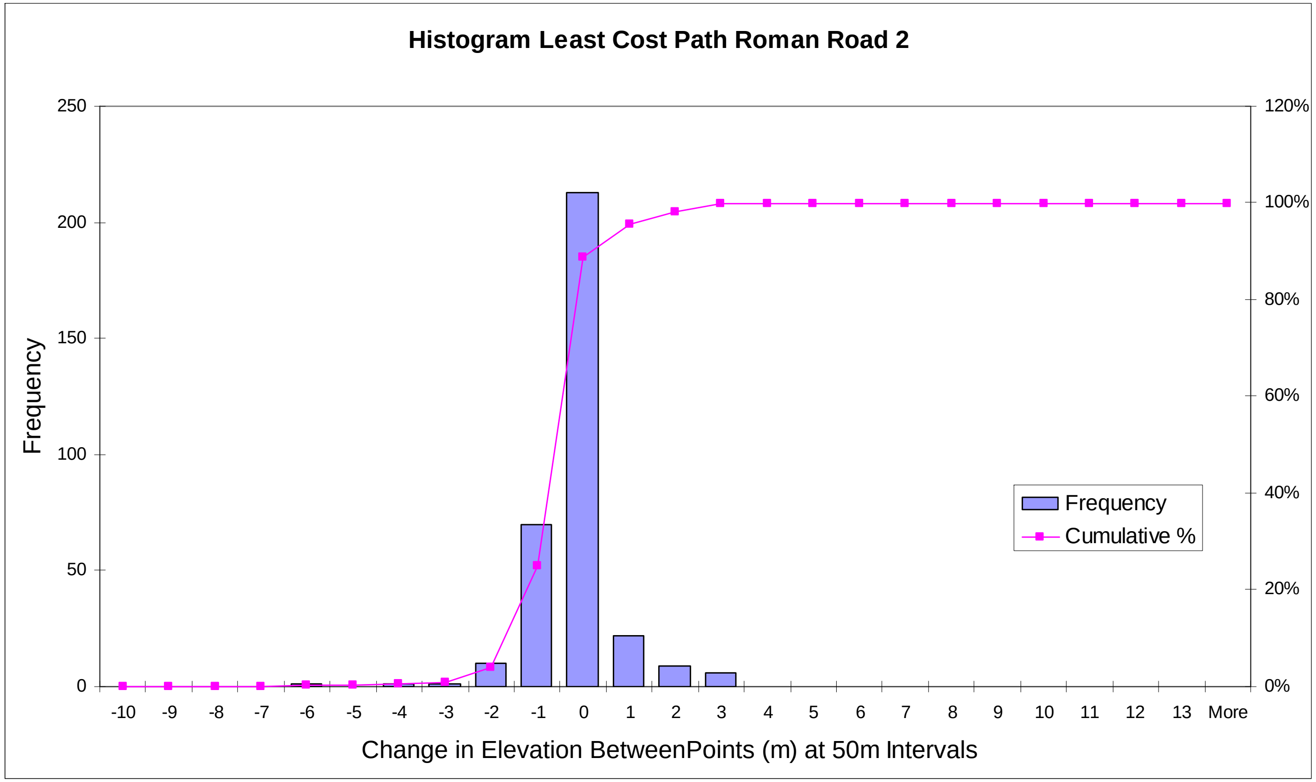


Figure 35: Roman Road 2**:** Histogram Least Cost

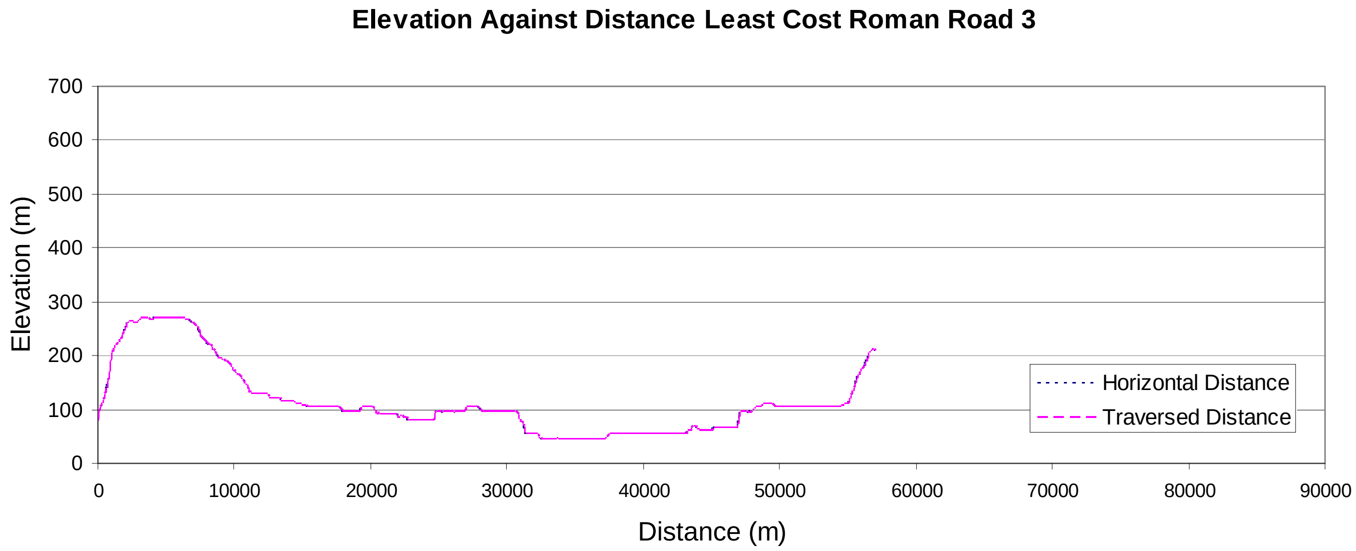


Figure 36: Roman Road 3: Elevation against Distance Least Cost

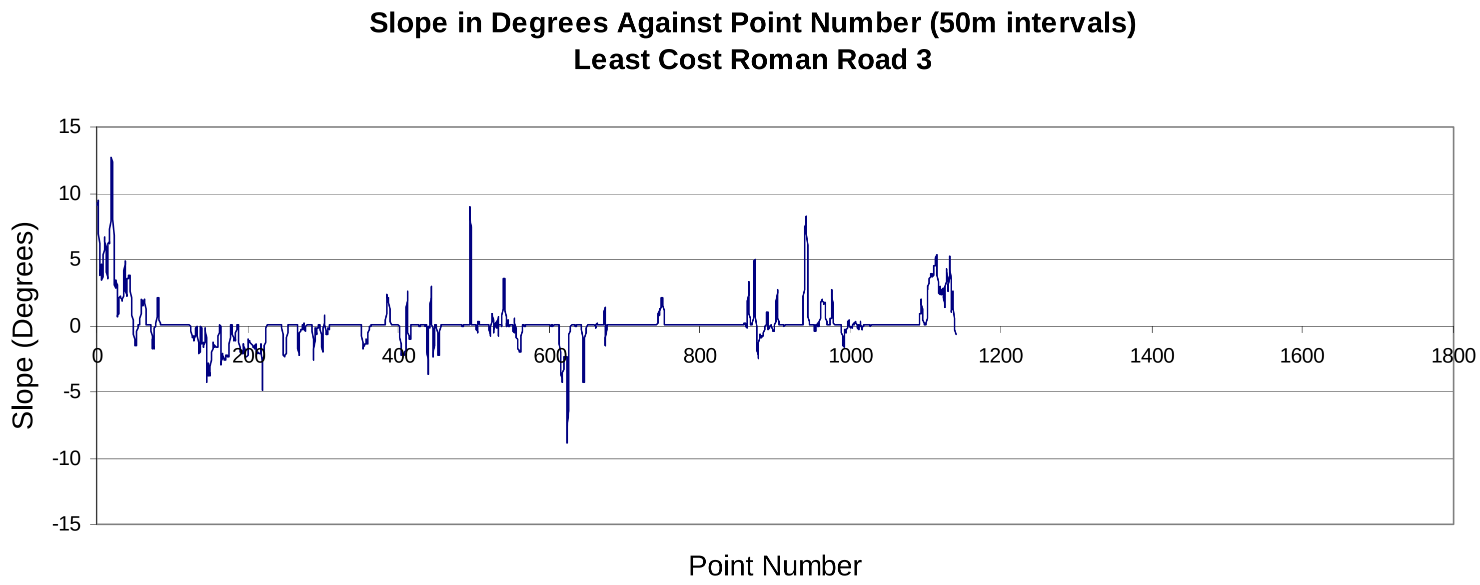


Figure 37: Roman Road 3: Slope in Degrees against Point Number Least Cost

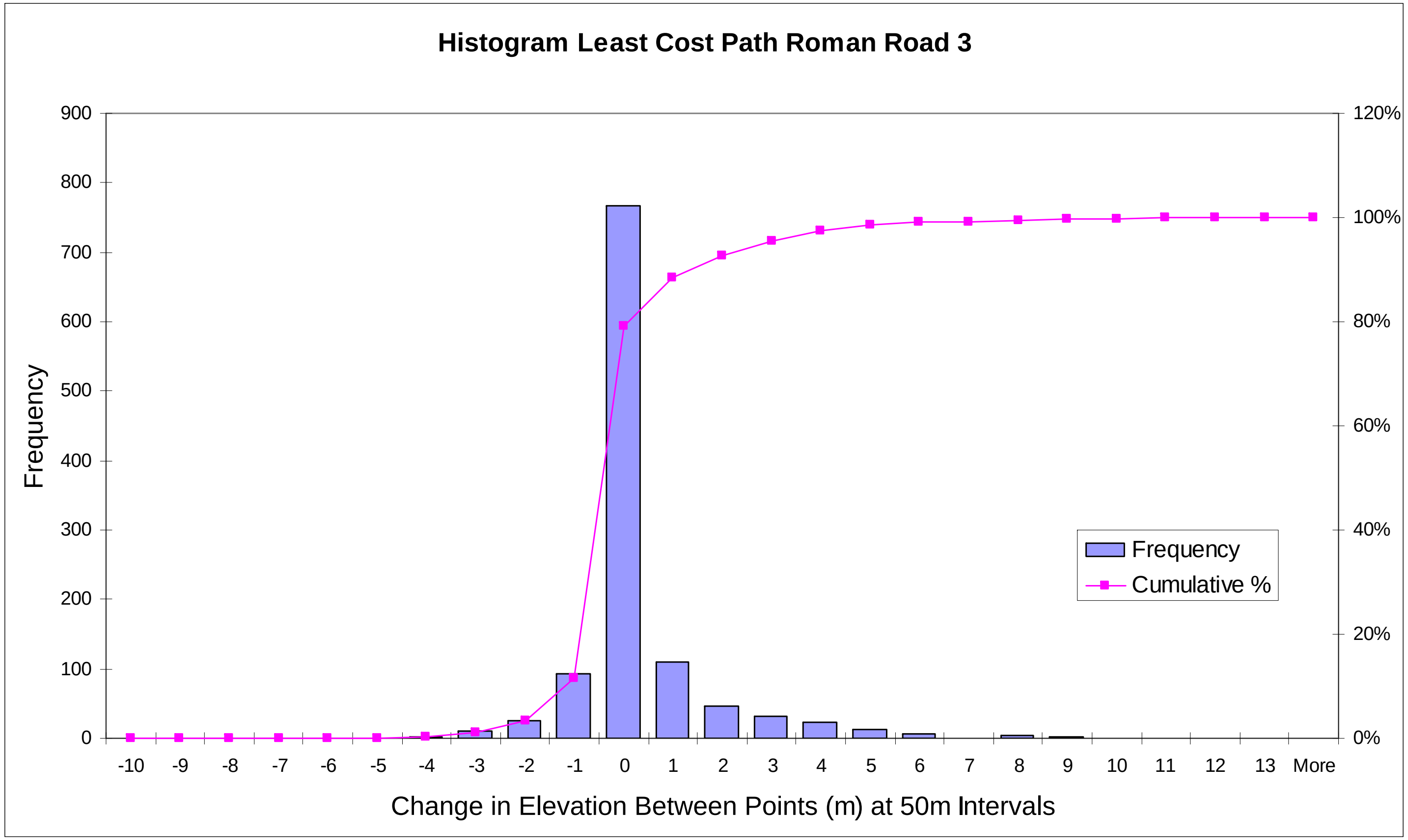


Figure 38: Roman Road 3: Histogram Least Cost

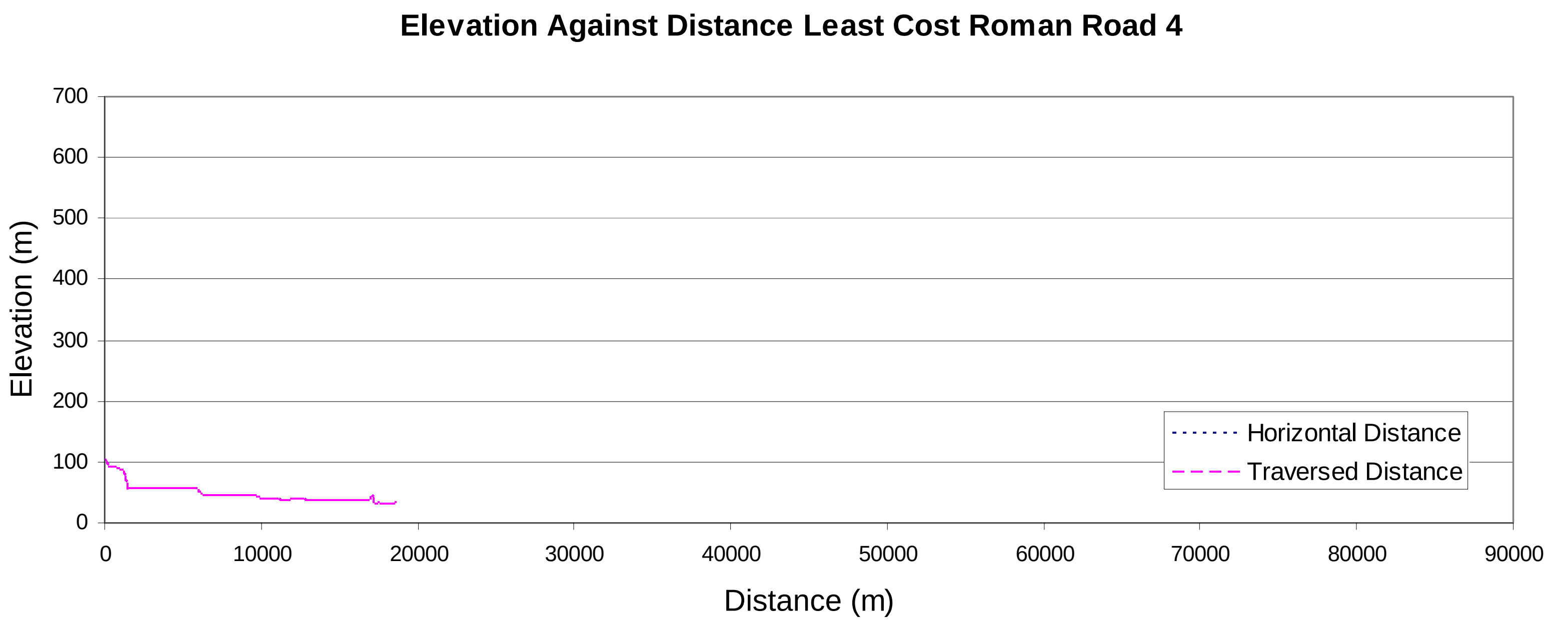


Figure 39: Roman Road 4: Elevation against Distance Least Cost

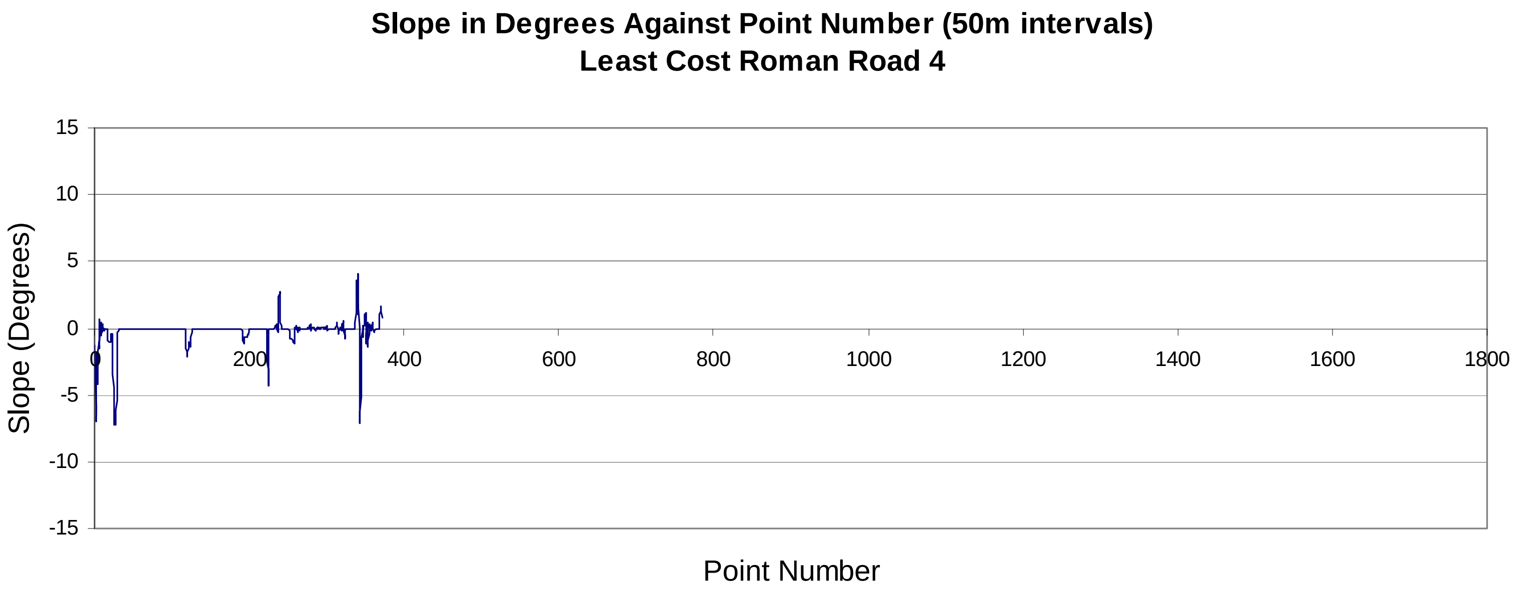


Figure 40: Roman Road 4: Slope in Degrees against Point Number Least Cost

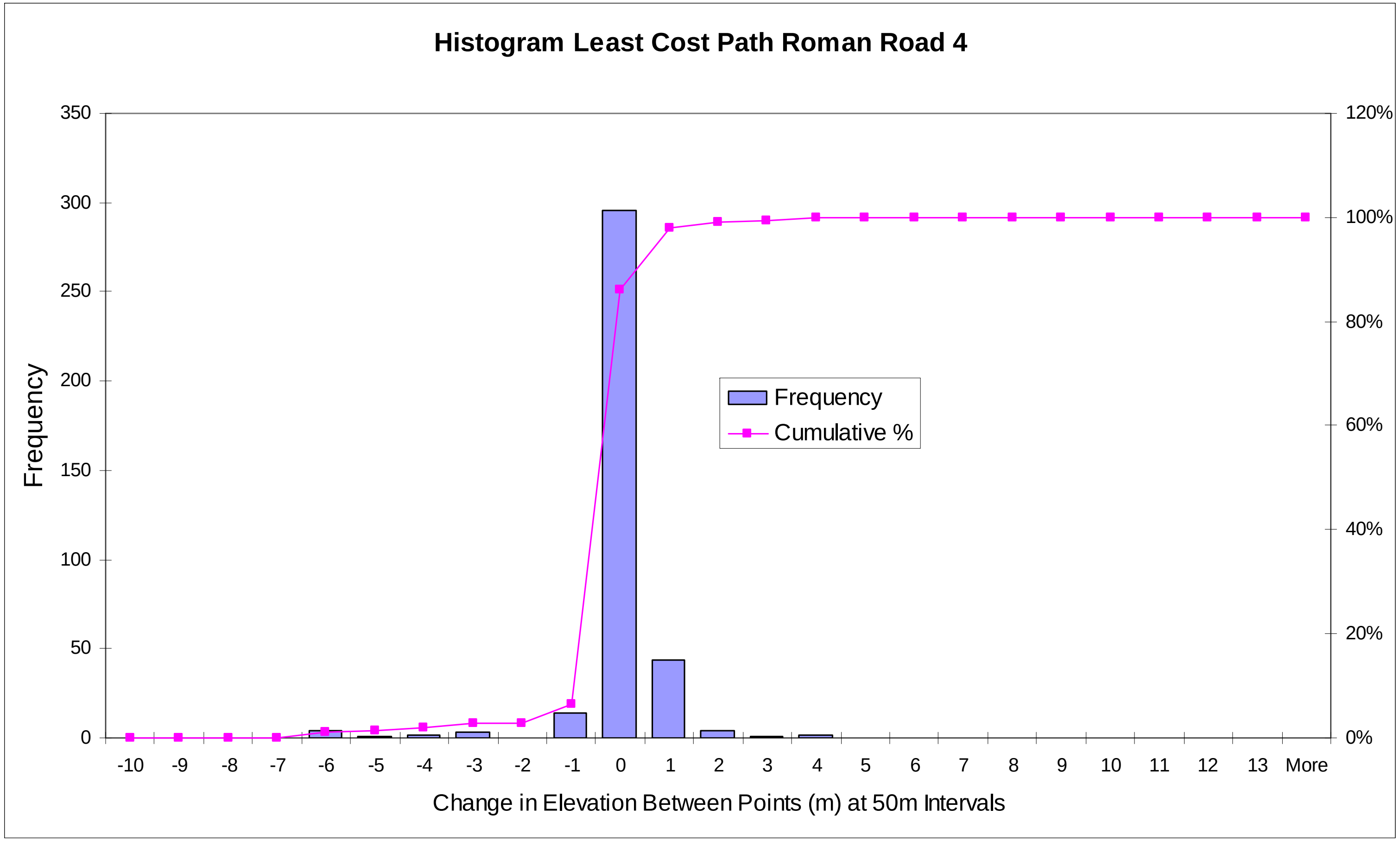


Figure 41: Roman Road 4: Histogram Least Cost

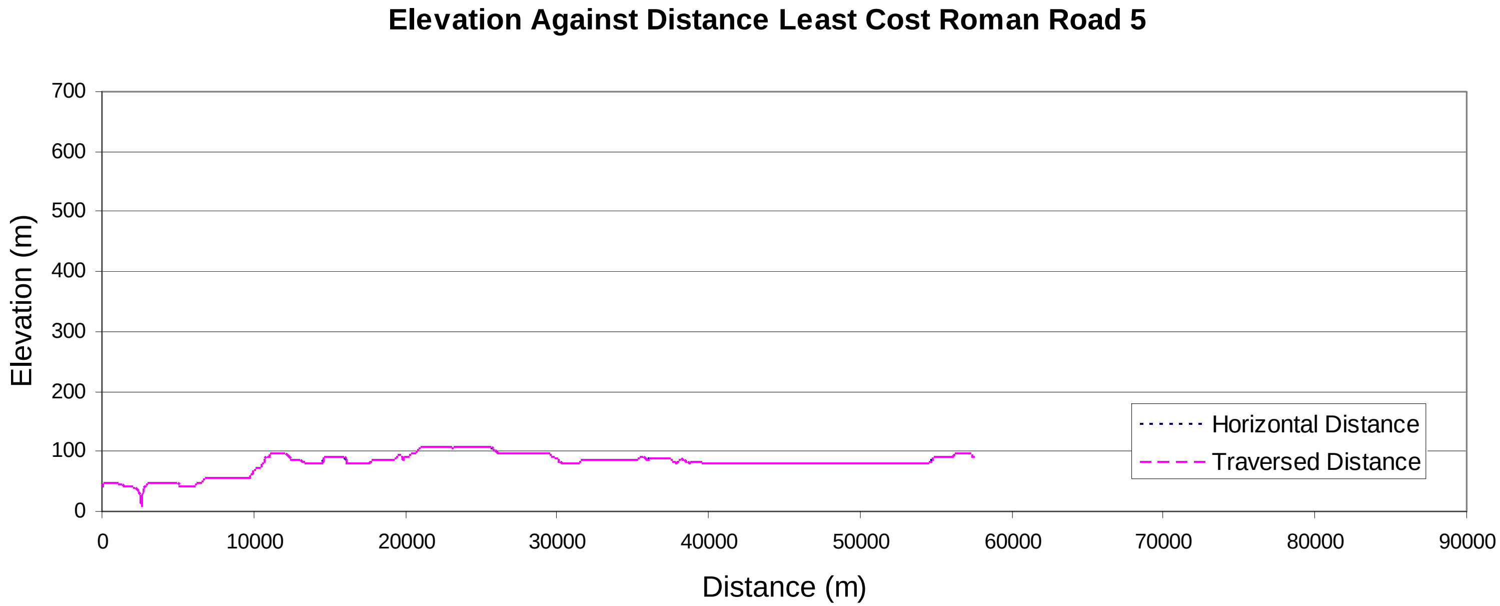


Figure 42: Roman Road 5: Elevation against Distance Least Cost

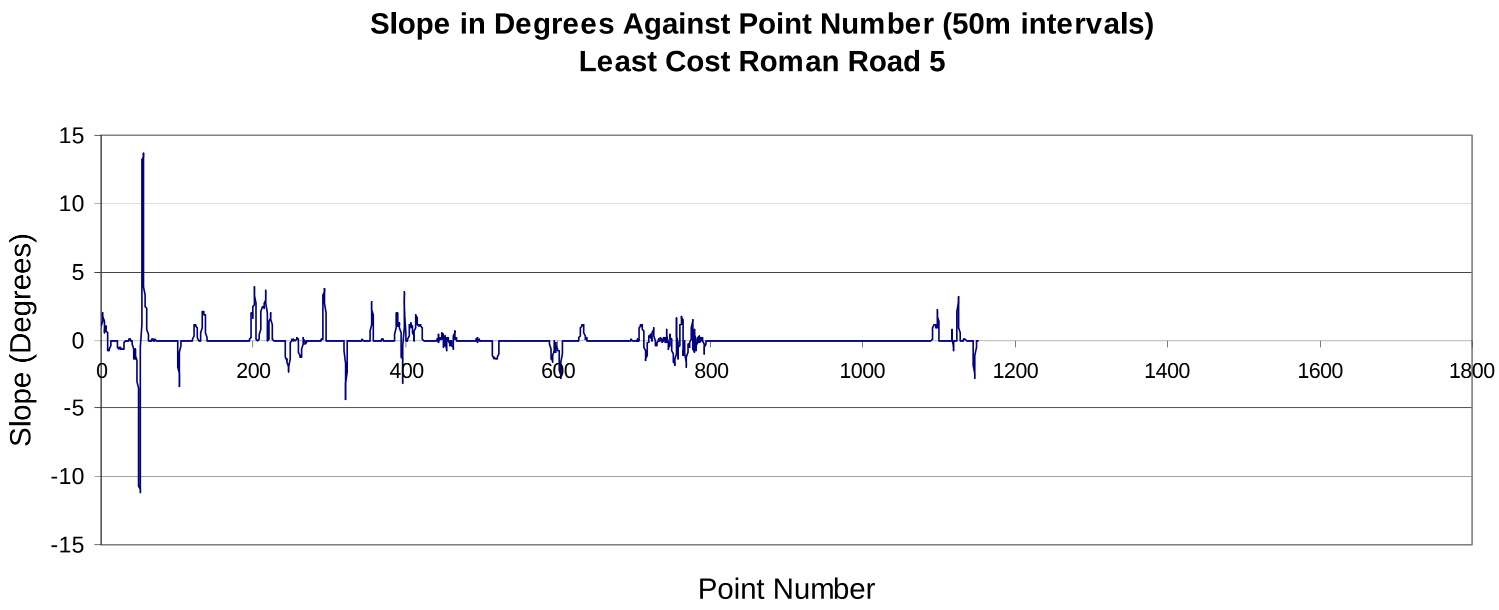


Figure 43: Roman Road 5: Slope in Degrees against Point Number Least Cost

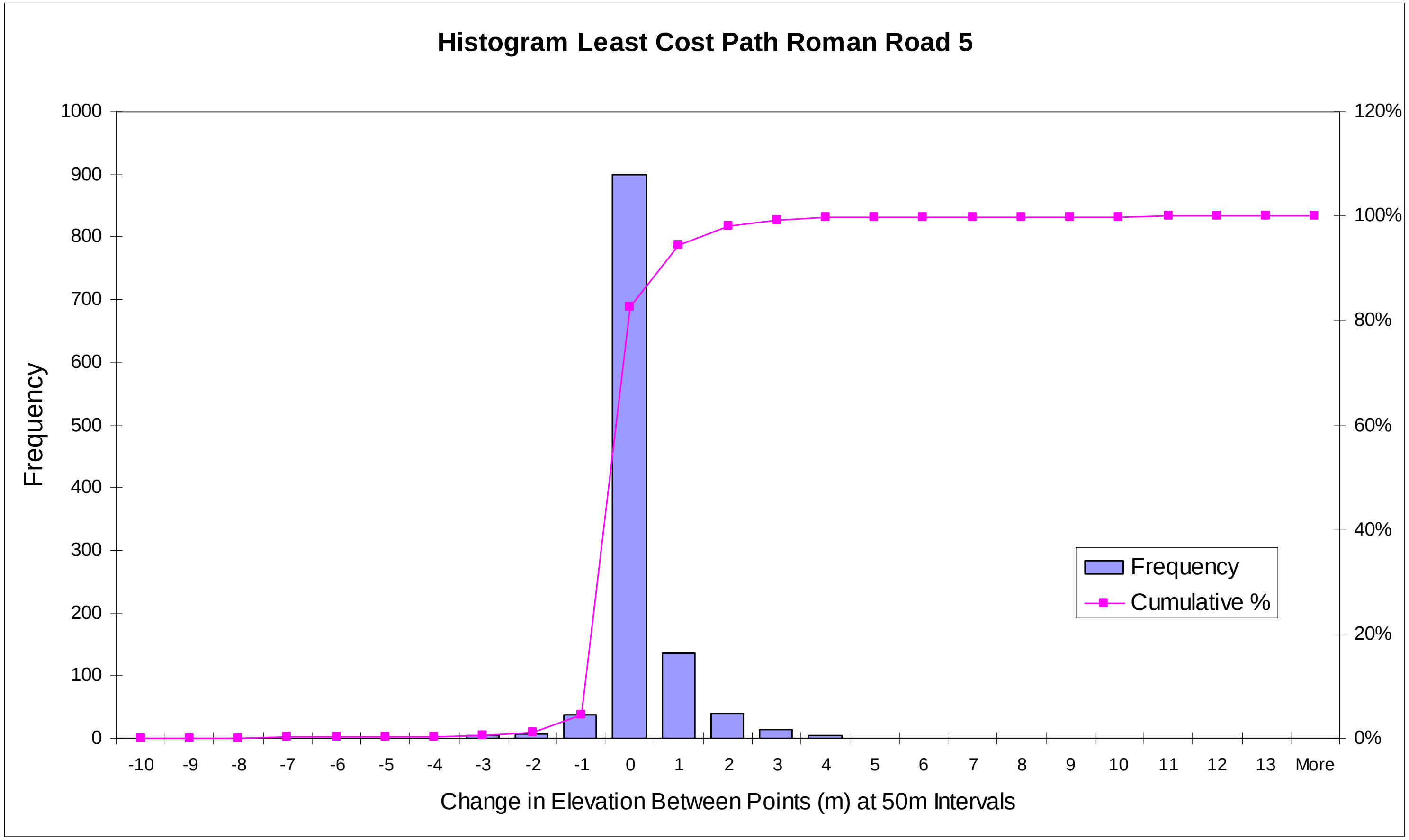


Figure 44: Roman Road 5: Histogram Least Cost

12.4 Illustrations for Chapter 5: Drove Routes

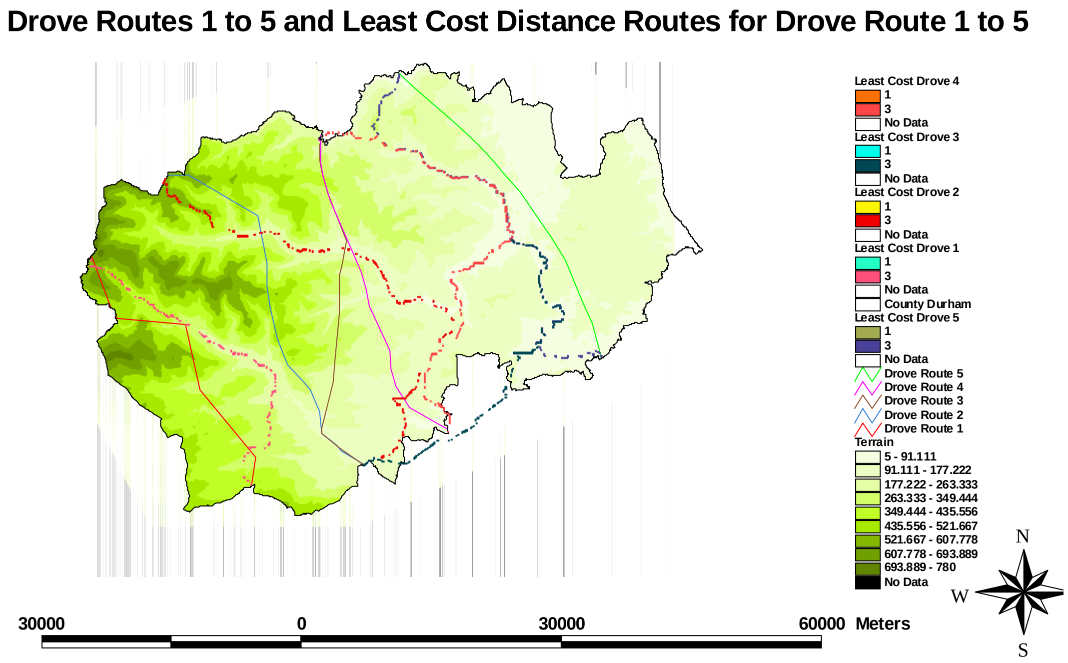


Figure 45: Drove Routes 1 to 5 and the Least Cost Routes of the Drove Routes 1-5

12.4.1 Drove Routes

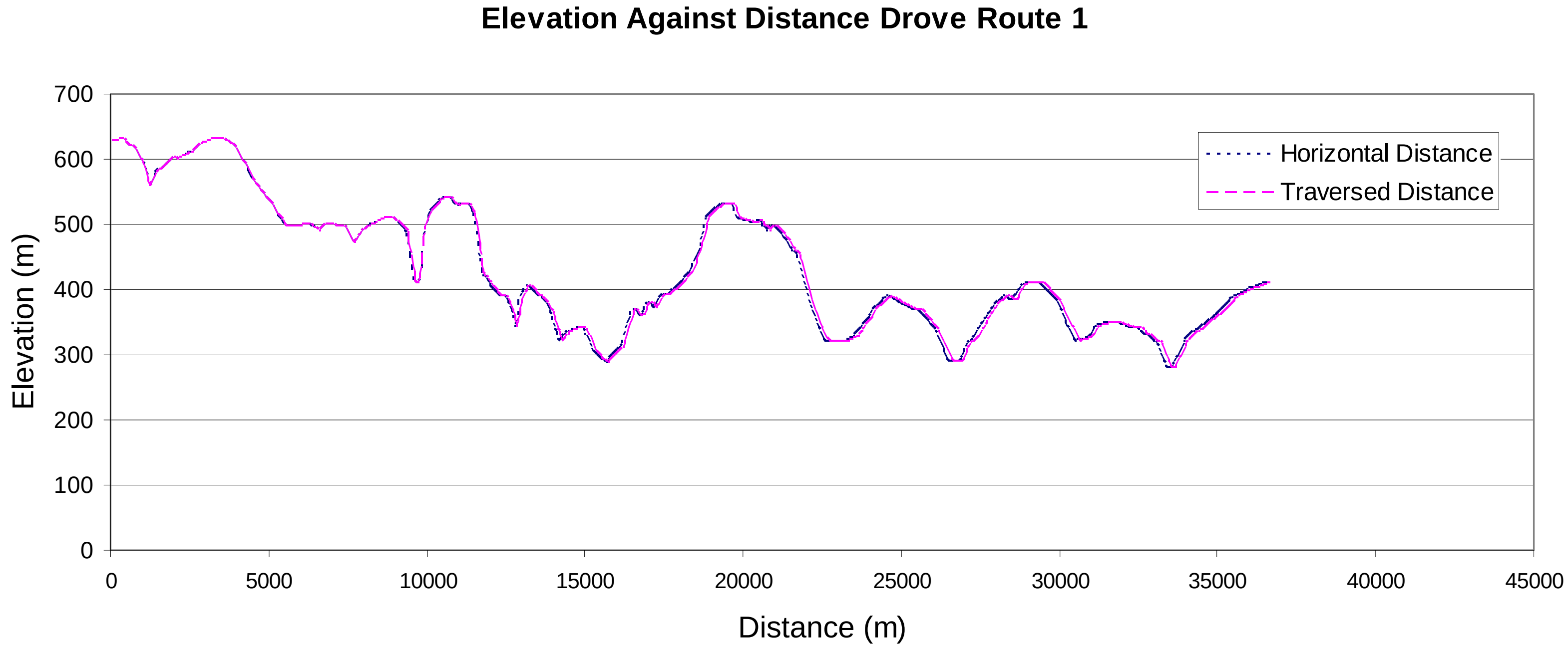


Figure 46: Drove Route 1: Elevation against Distance

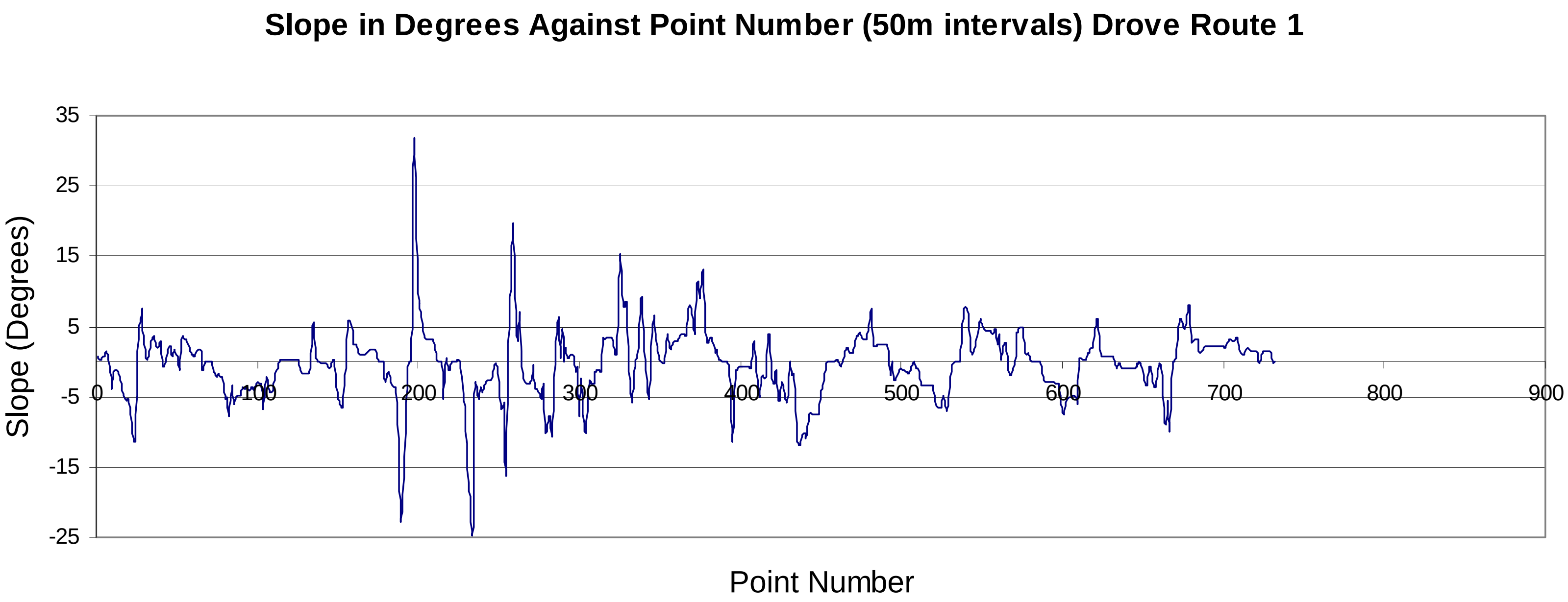


Figure 47: Drove Route 1: Slope in Degrees against Point Number

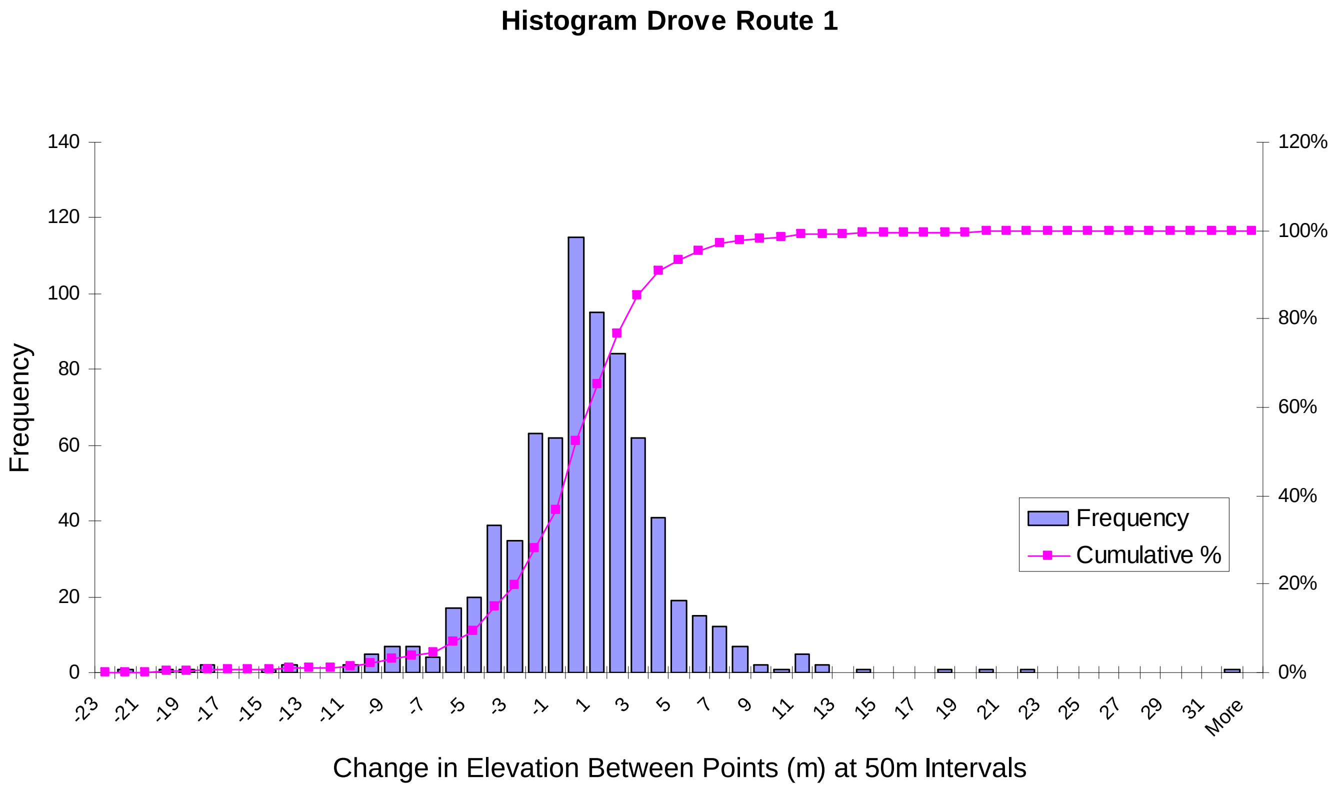


Figure 48: Drove Route 1: Histogram

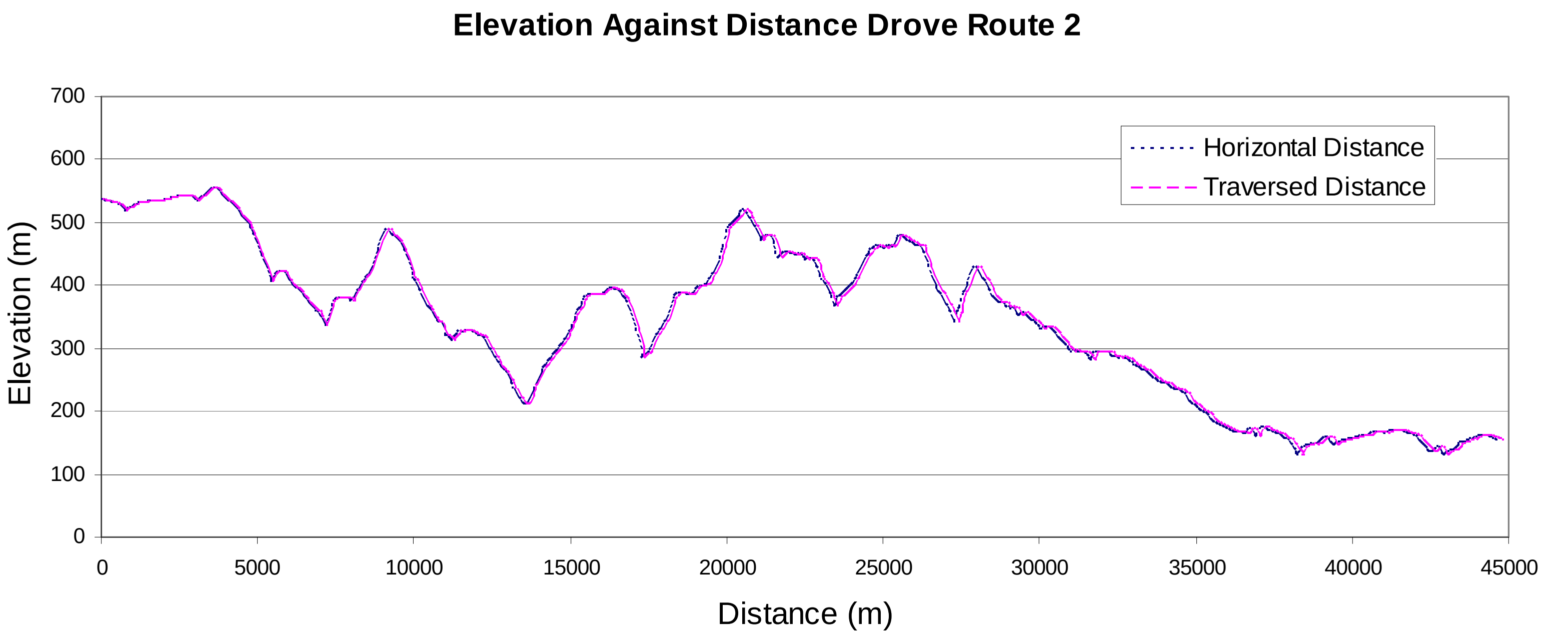


Figure 49: Drove Route 2: Elevation against Distance

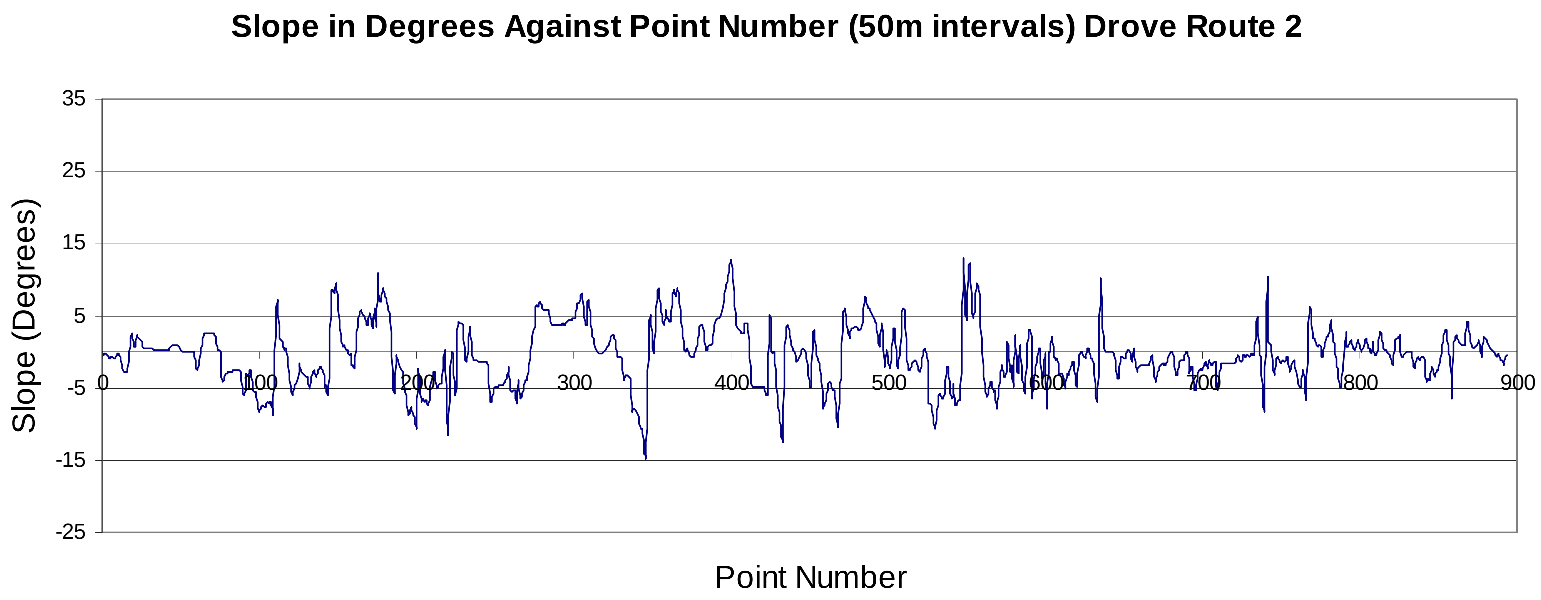


Figure 50: Drove Route 2: Slope in Degrees against Point Number

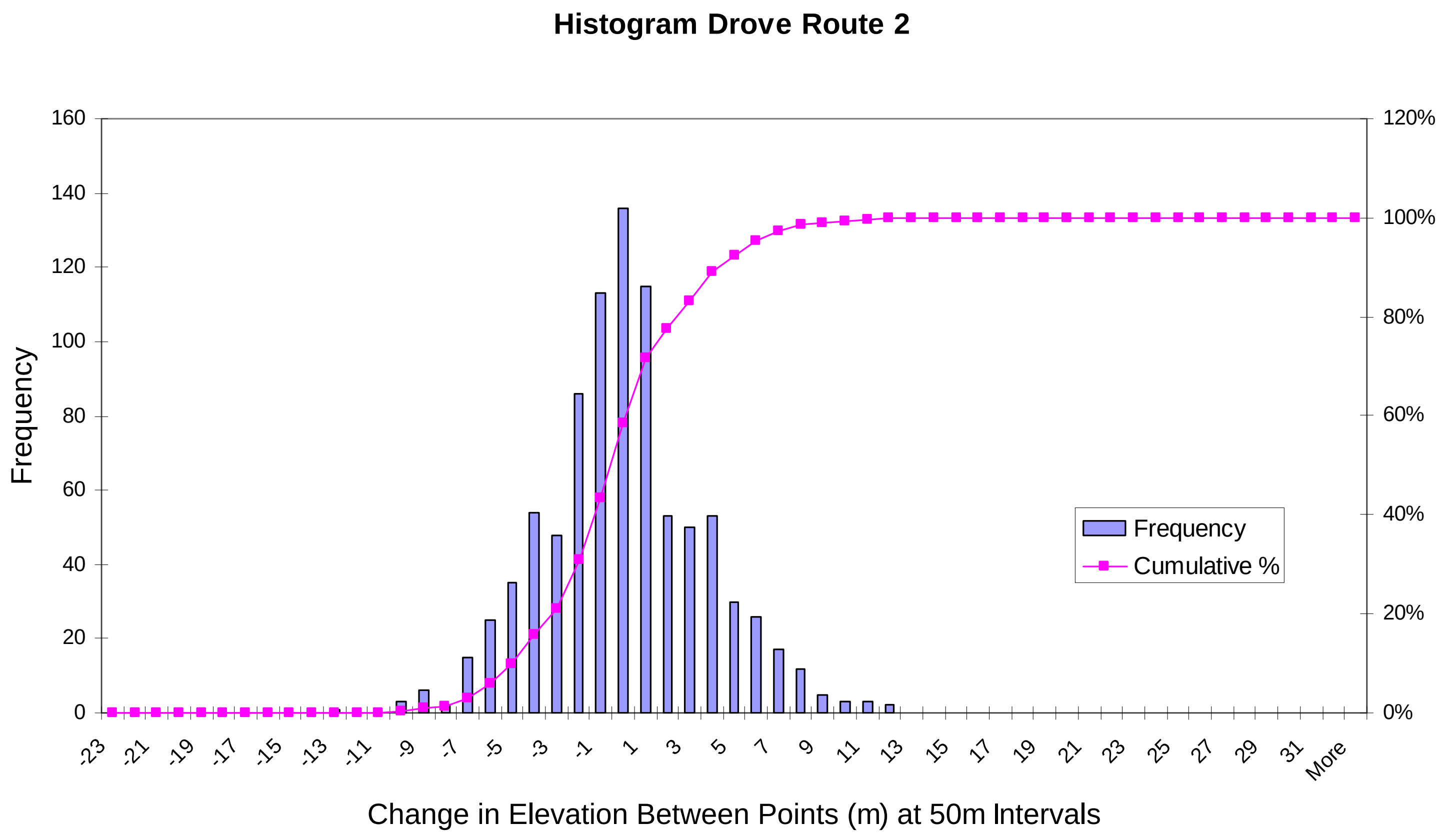


Figure 51: Drove Route 2: Histogram

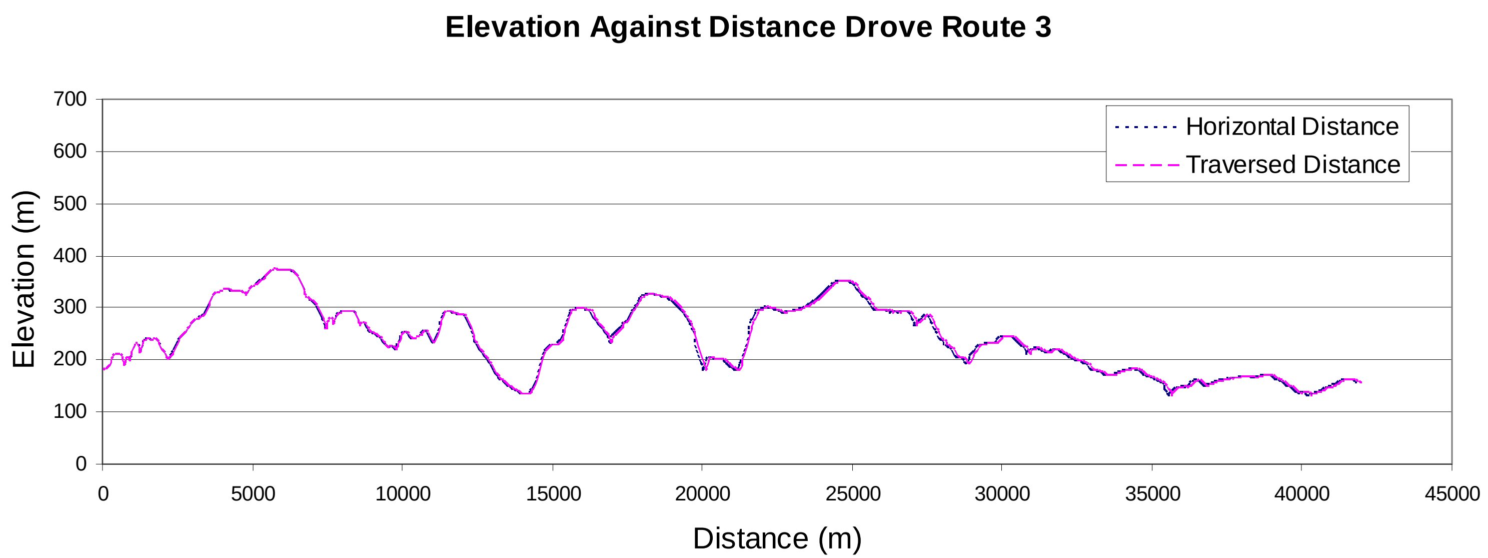


Figure 52: Drove Route 3: Elevation against Distance

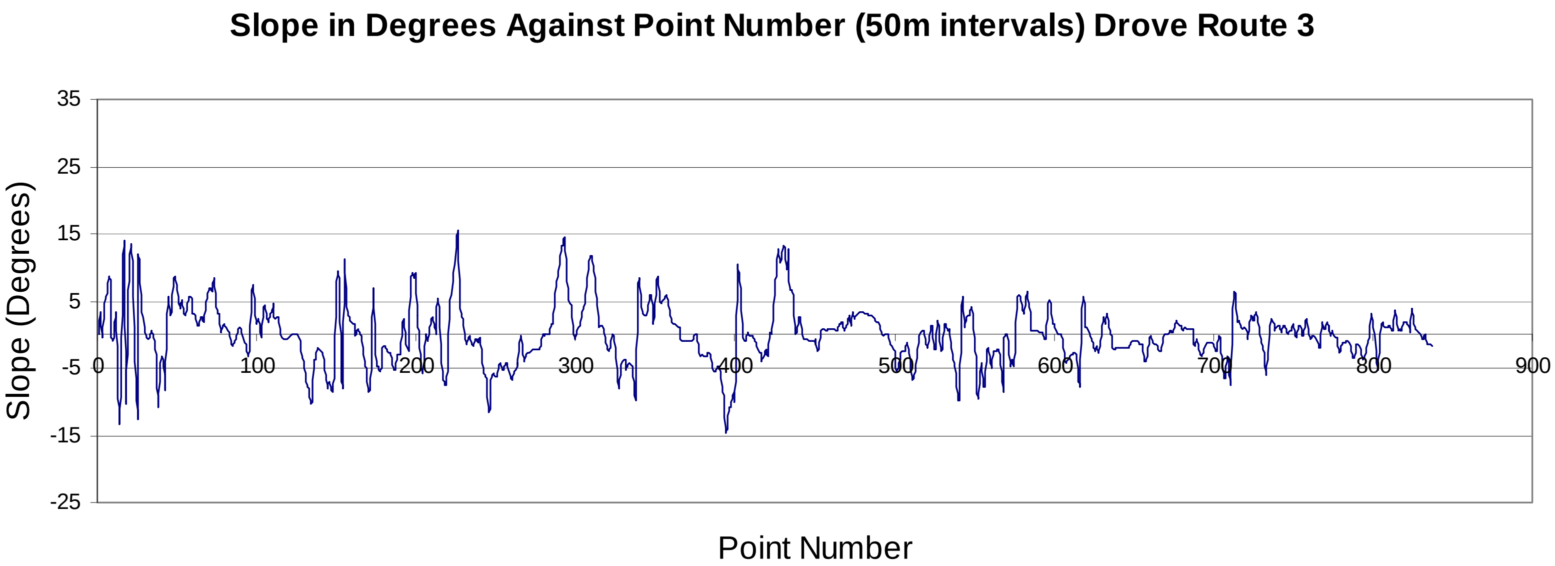


Figure 53: Drove Route 3 Slope in Degrees against Point Number

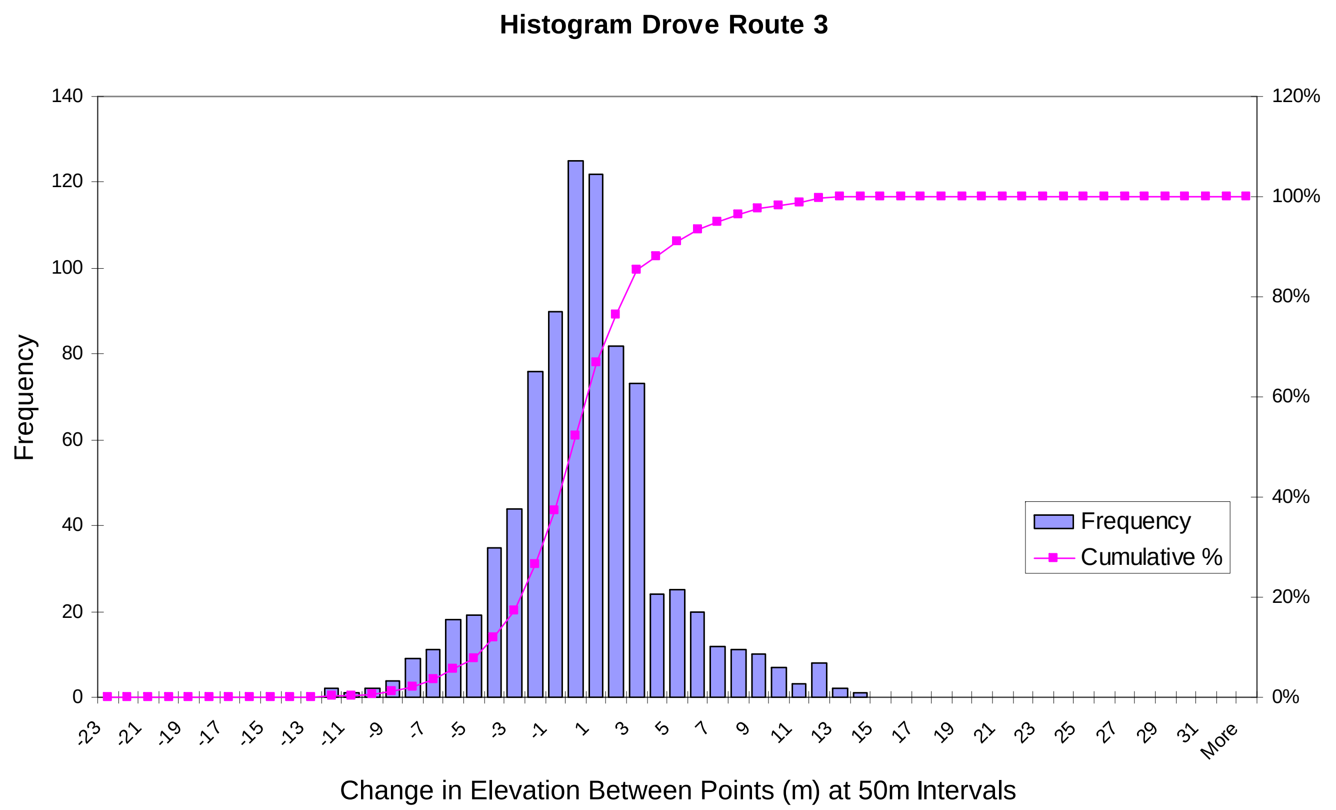


Figure 54: Drove Route 3: Histogram

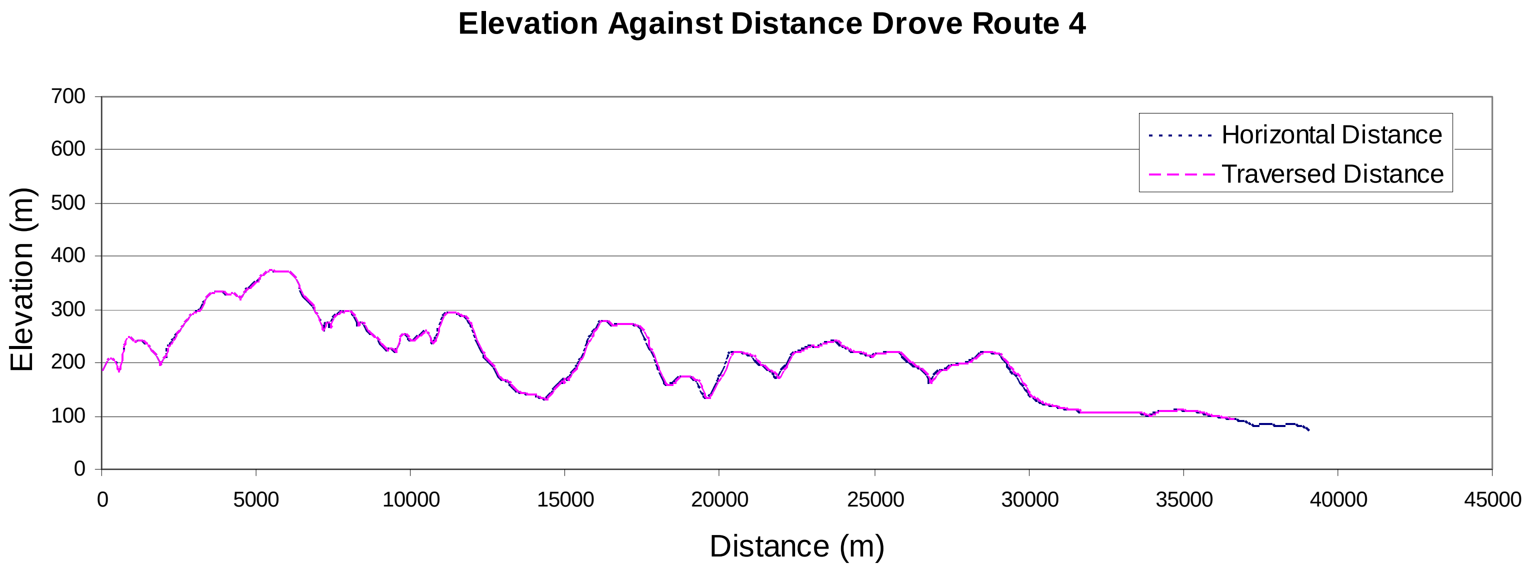


Figure 55: Drove Route 4: Elevation against Distance

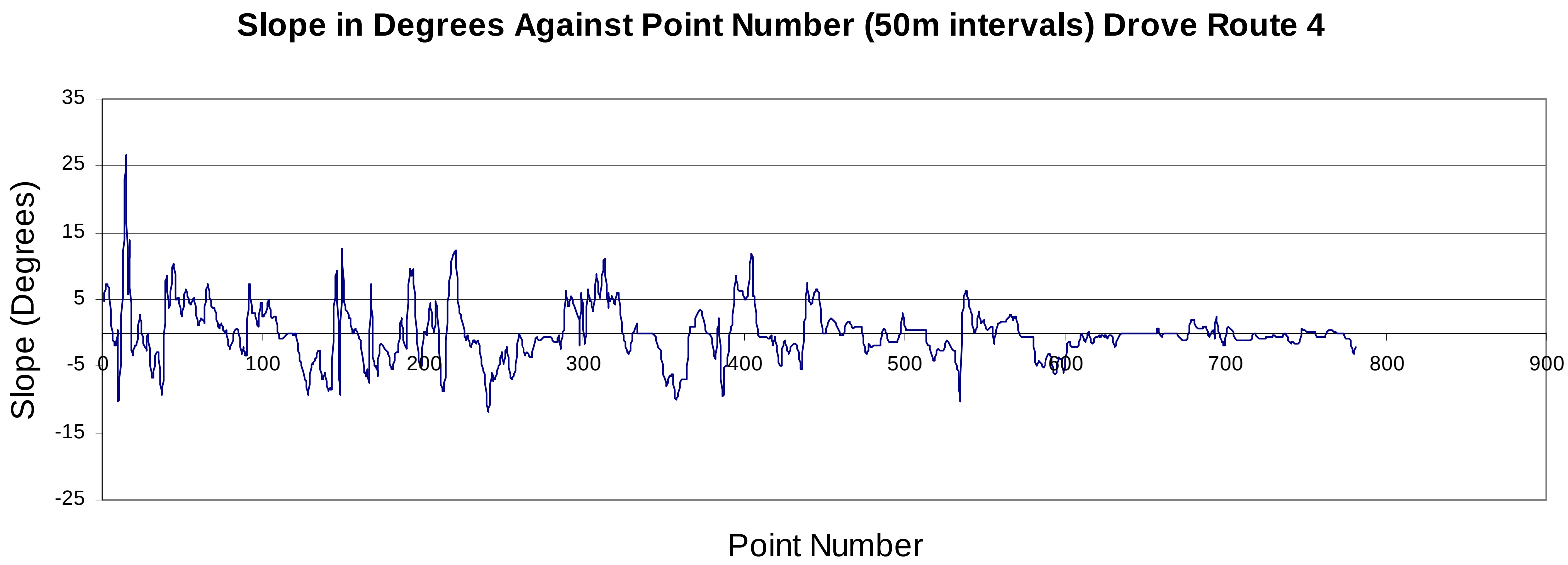


Figure 56: Drove Route 4: Slope in Degrees against Point Number

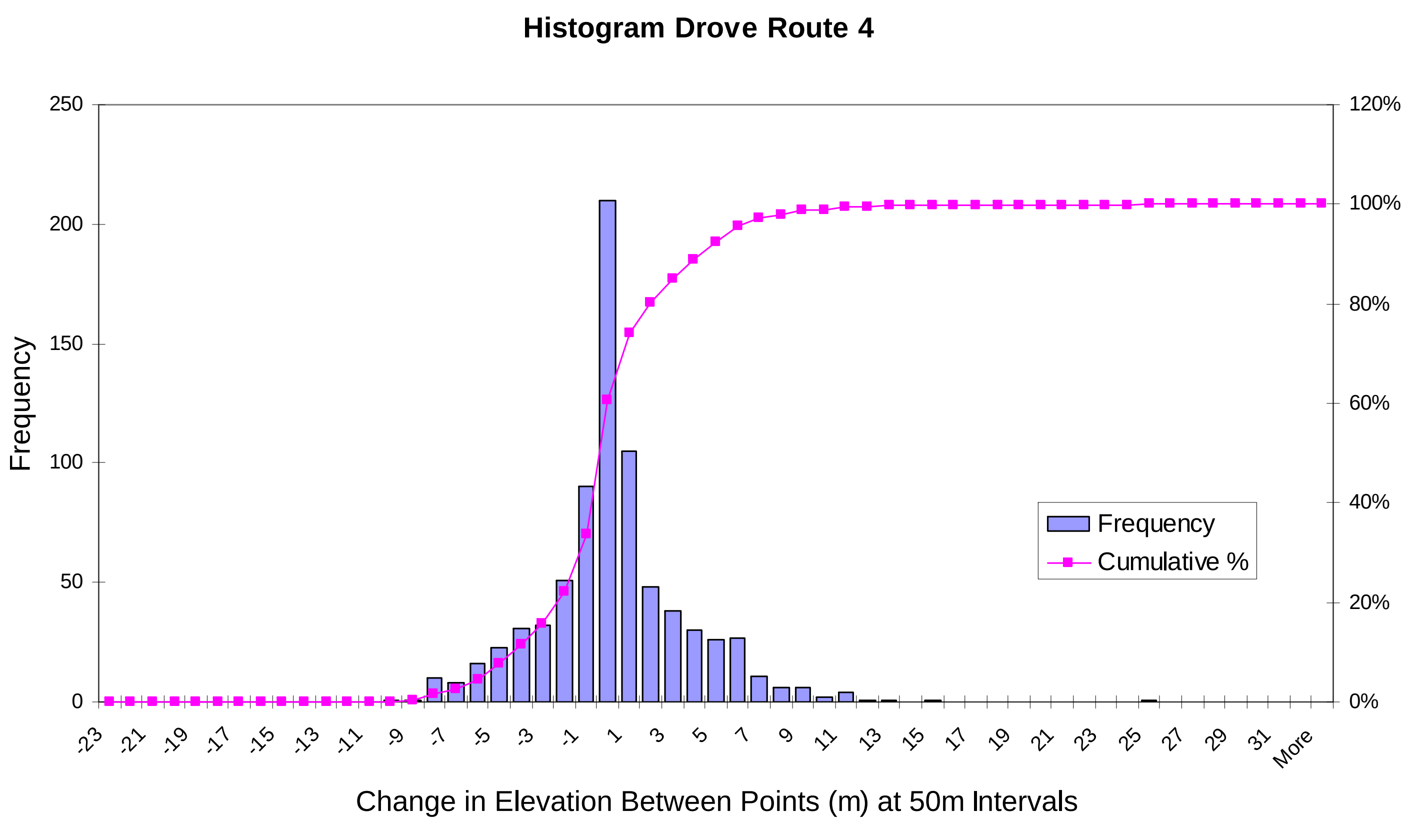


Figure 57: Drove Route 4: Histogram Drove Route 4

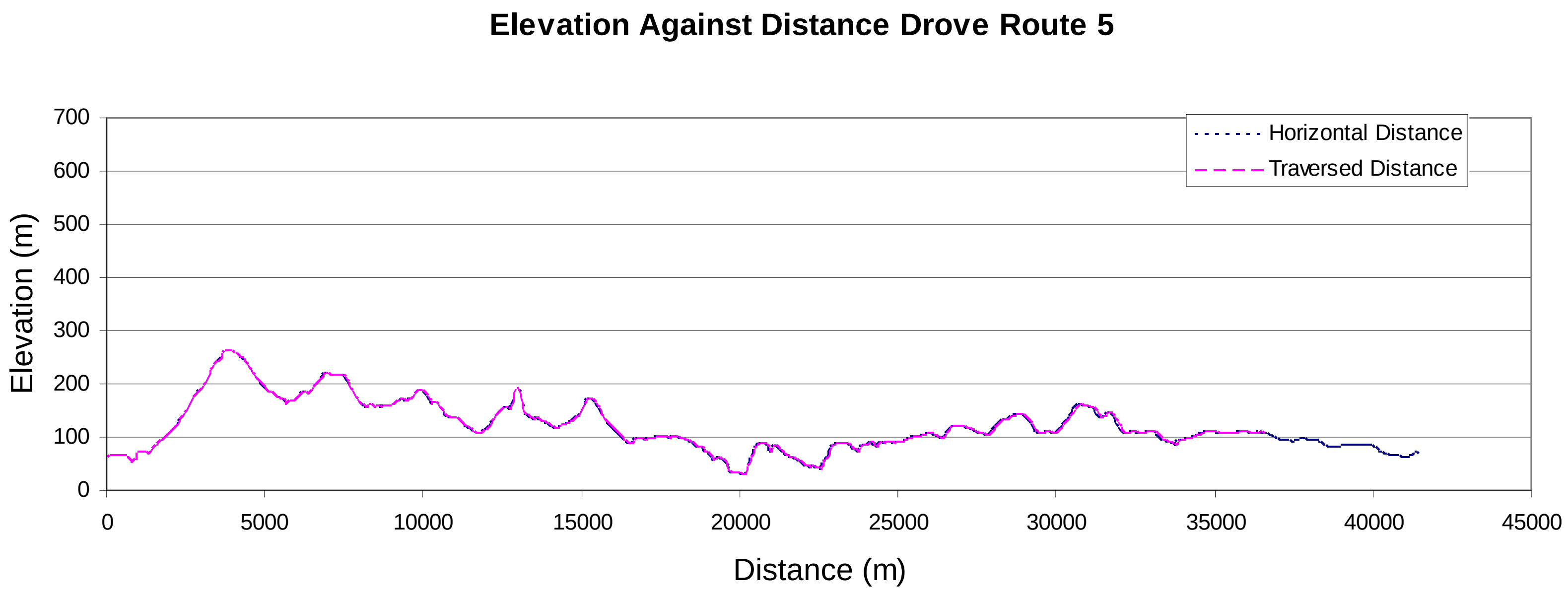


Figure 58: Drove Route 5:Elevation against Distance

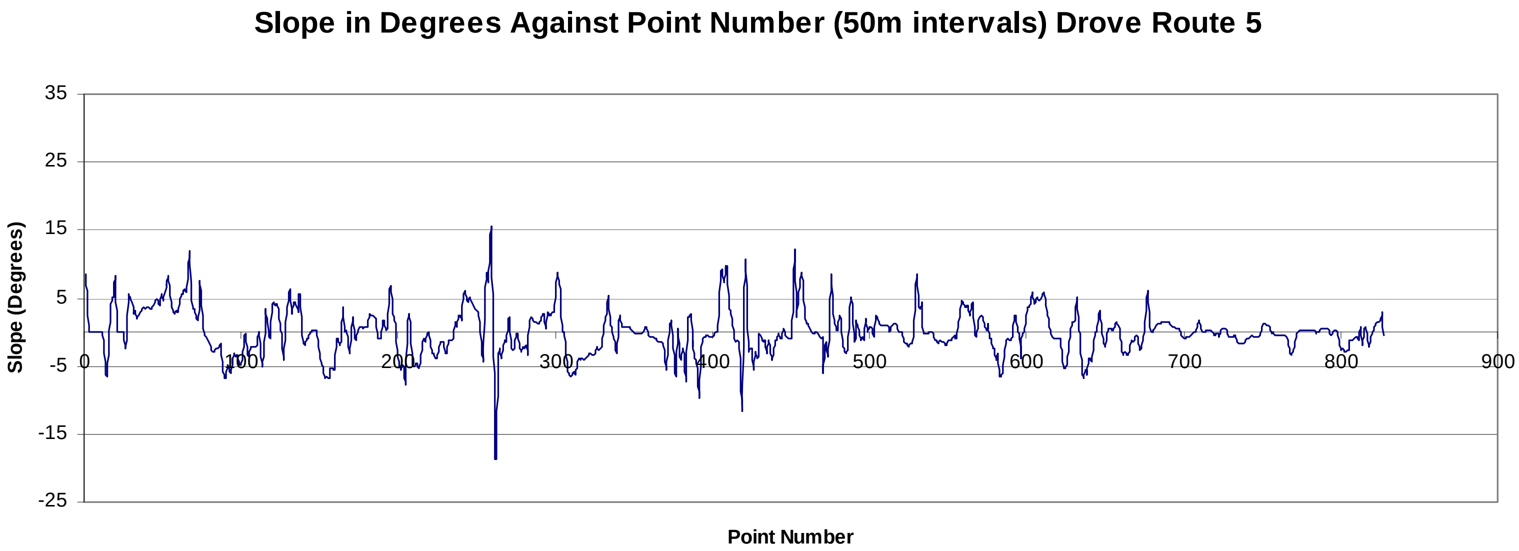


Figure 59: Drove Route 5: Slope in Degrees against Point Number

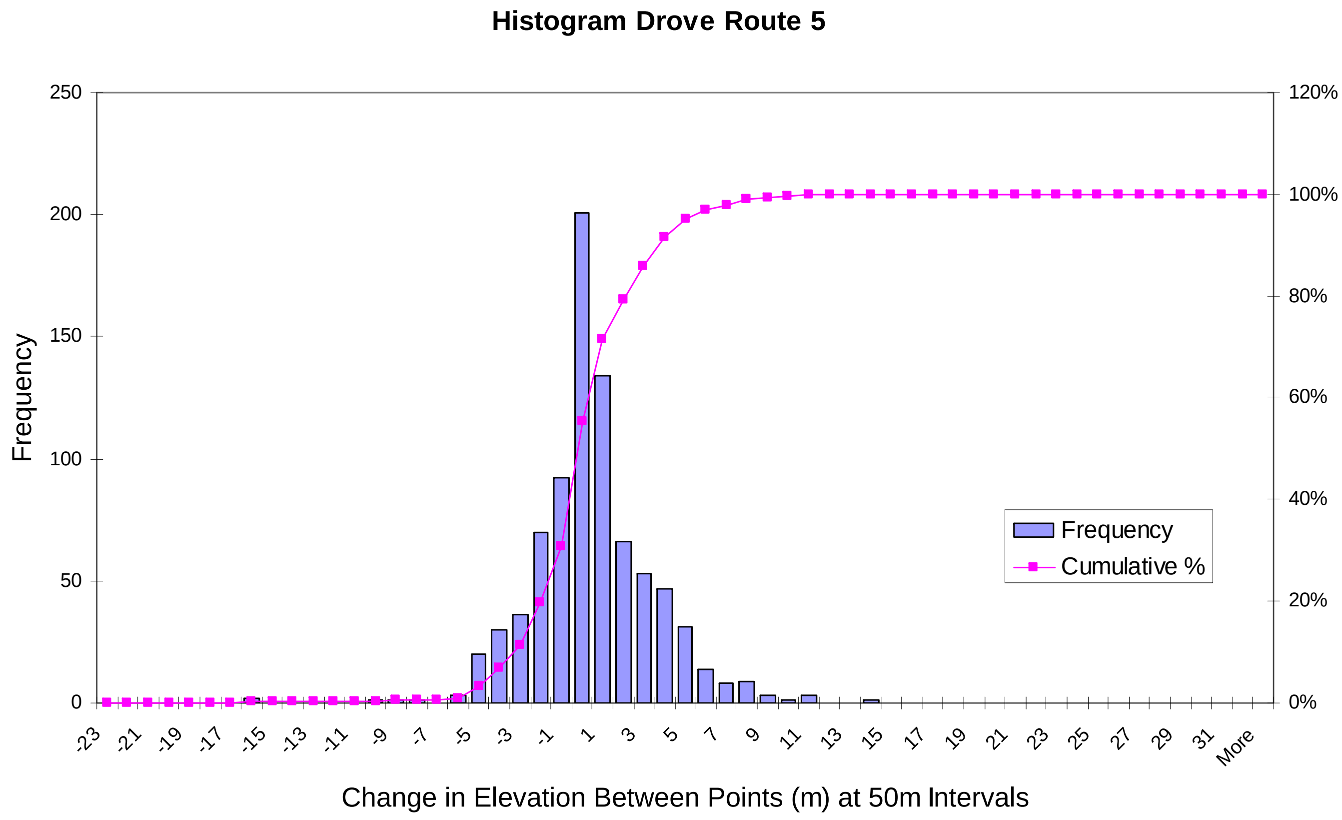


Figure 60: Drove Route 5: Histogram Drove

12.4.2 Least Cost Routes of the Drove Routes

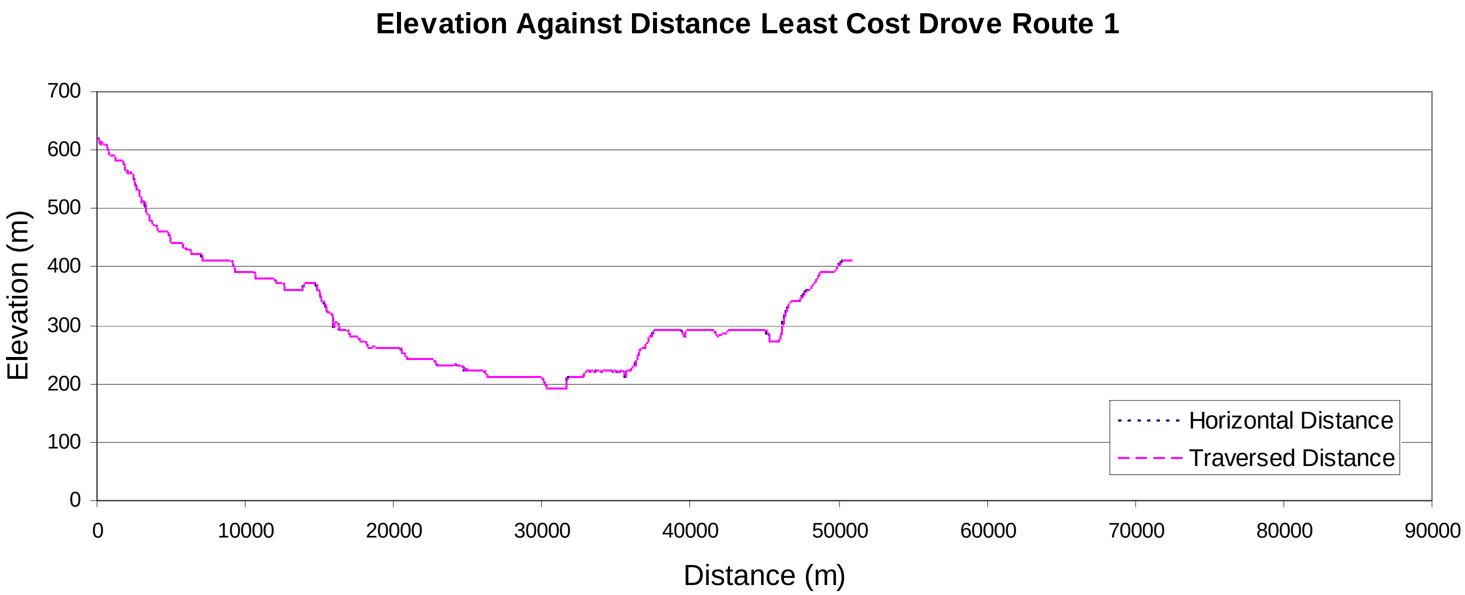


Figure 61: Drove Route 1: Elevation against Distance Least Cost

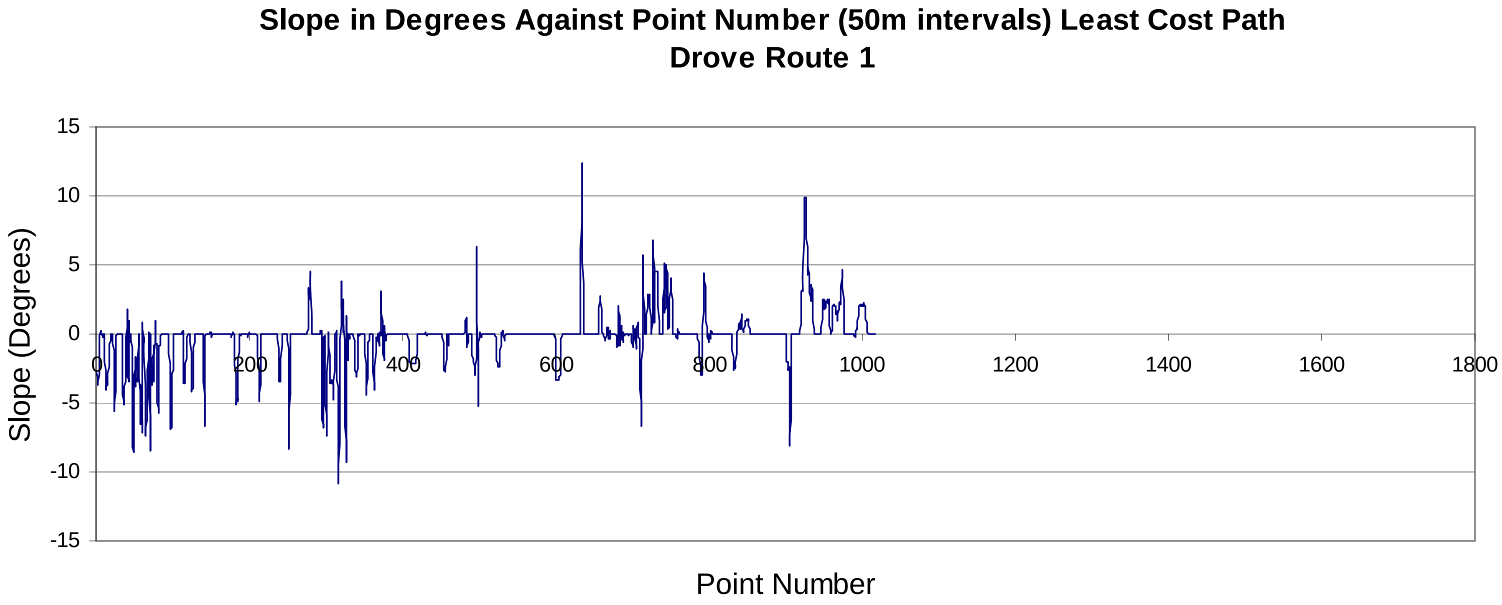


Figure 62: Drove Route 1: Slope in Degrees against Point Number Least Cost

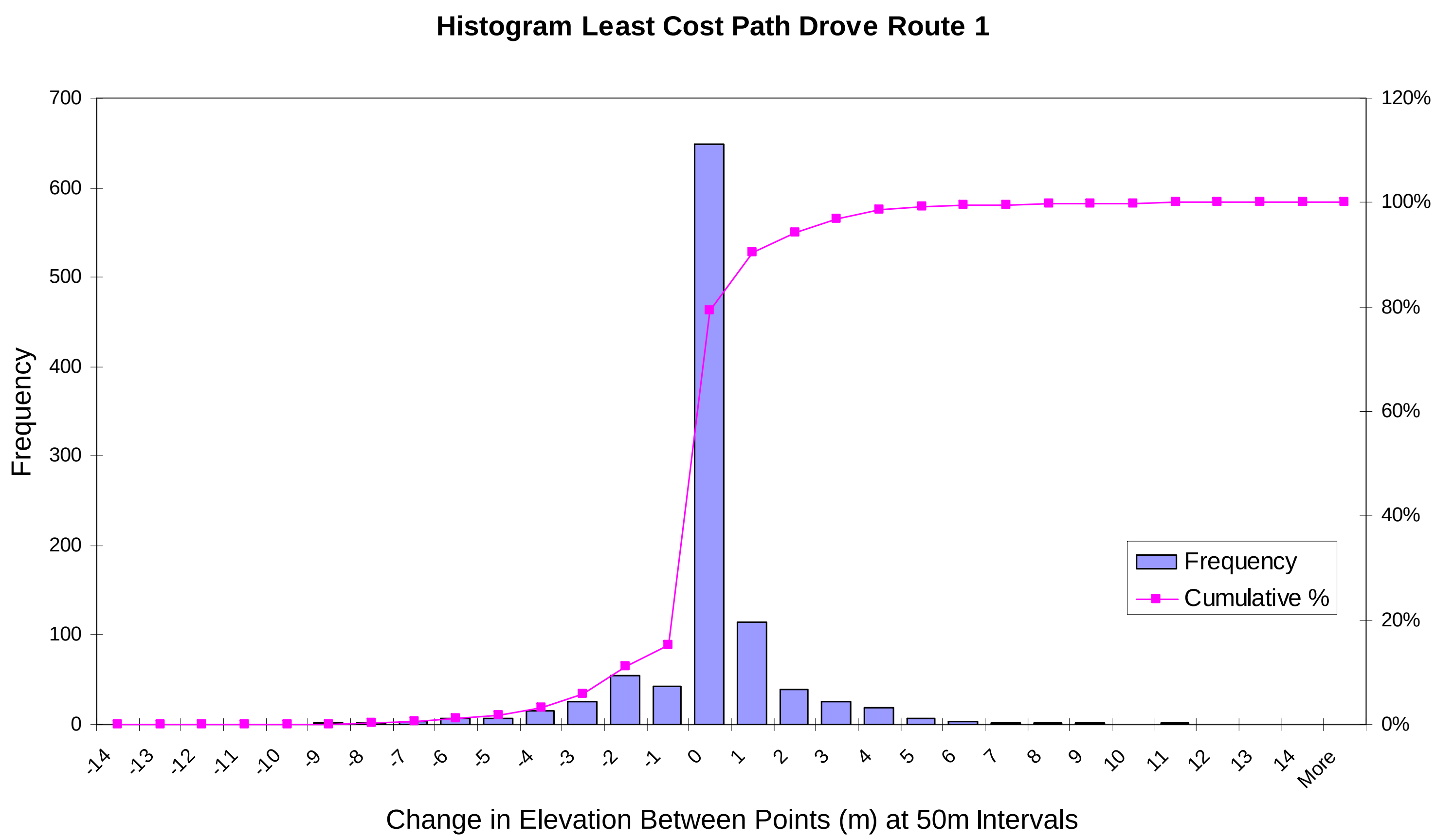


Figure 63: Drove Route 1: Histogram Least Cost

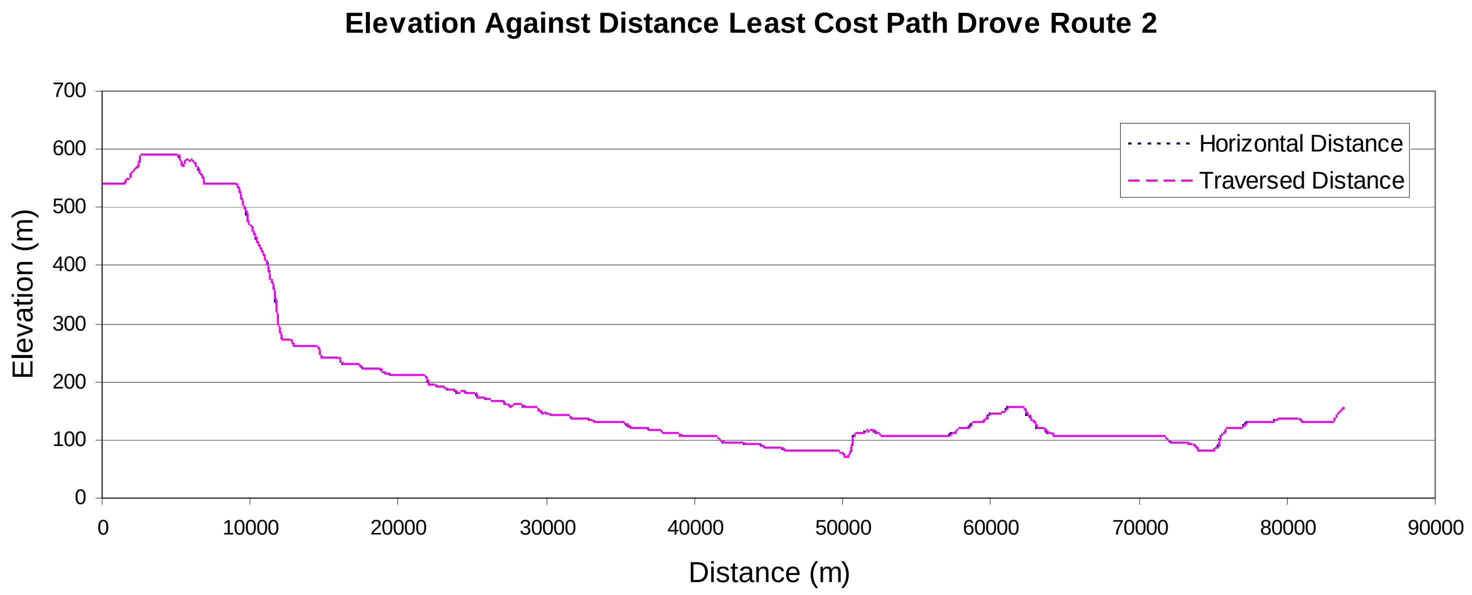


Figure 64: Drove Route 2: Elevation against Distance Least Cost

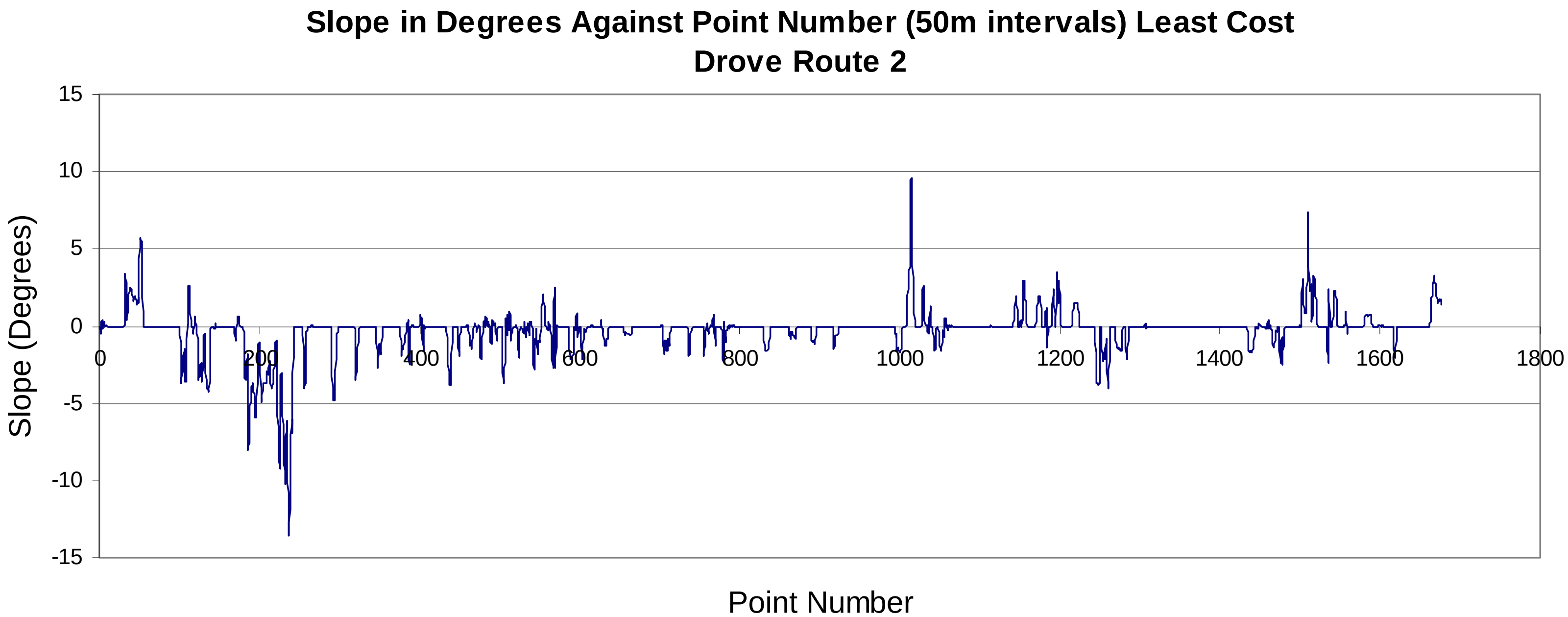


Figure 65: Drove Route 2: Slope in Degrees against Point Number Least Cost

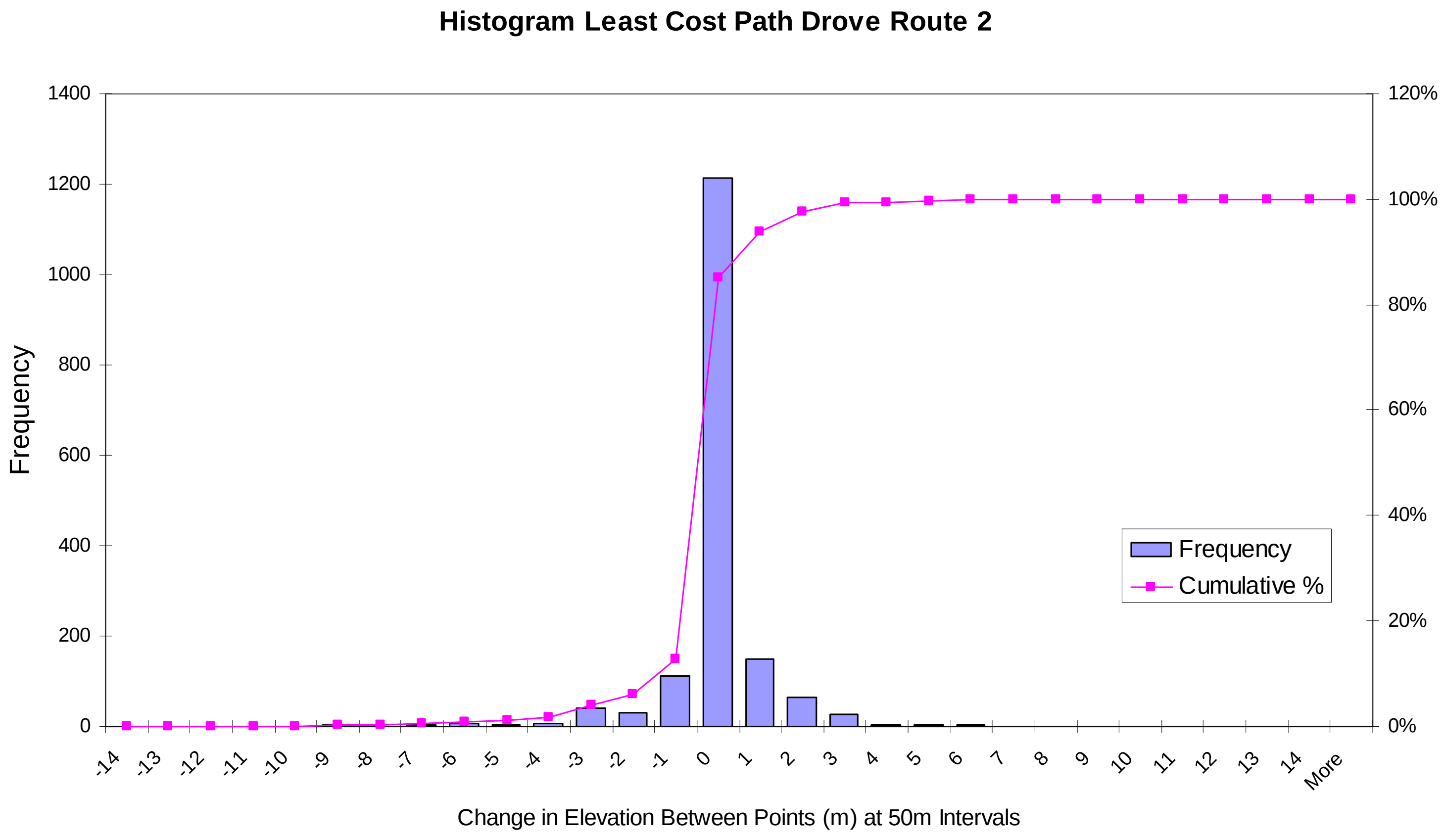


Figure 66: Drove Route 2: Histogram Least Cost

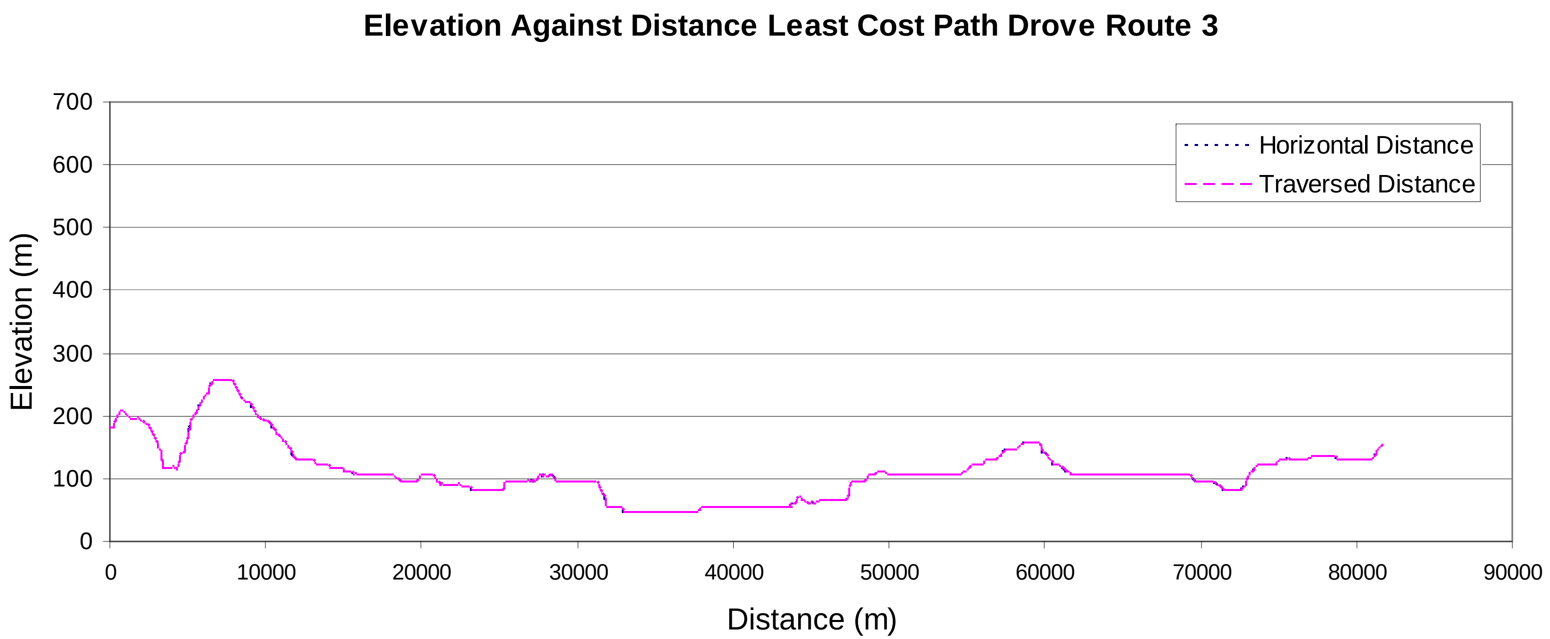


Figure 67: Drove Route 3: Elevation against Distance Least Cost

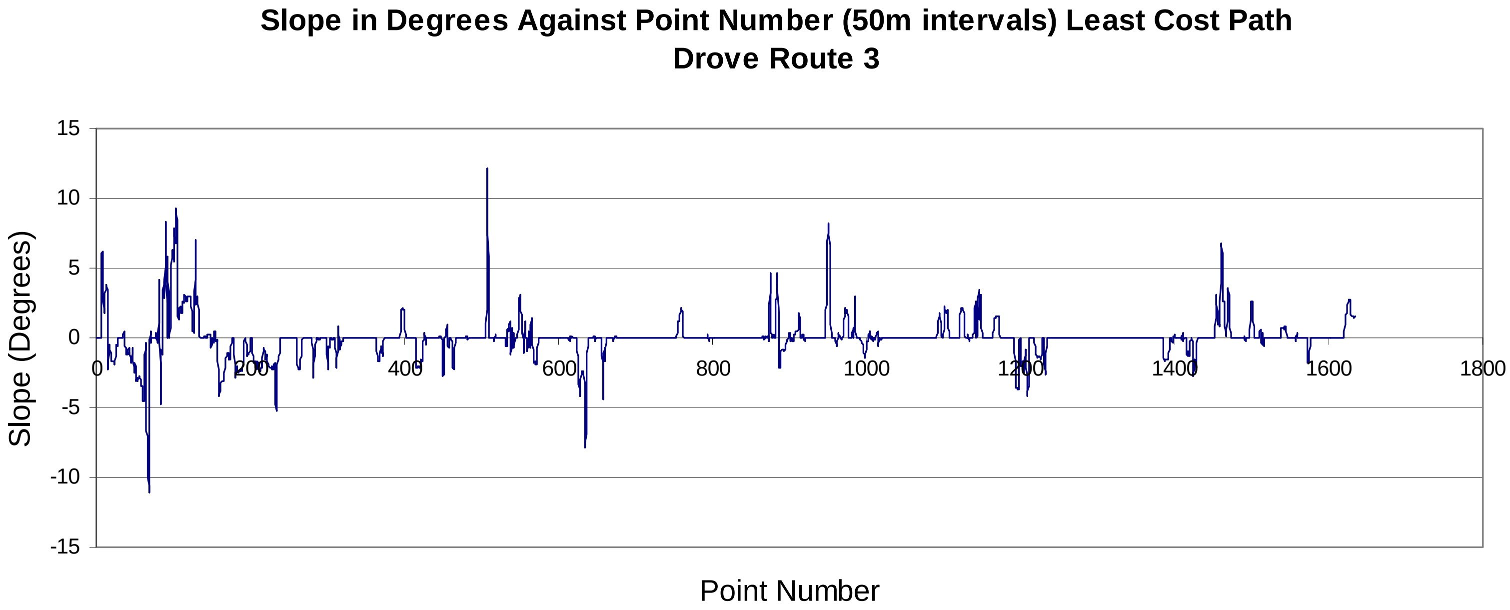


Figure 68: Drove Route 3: Slope in Degrees against Point Number Least Cost

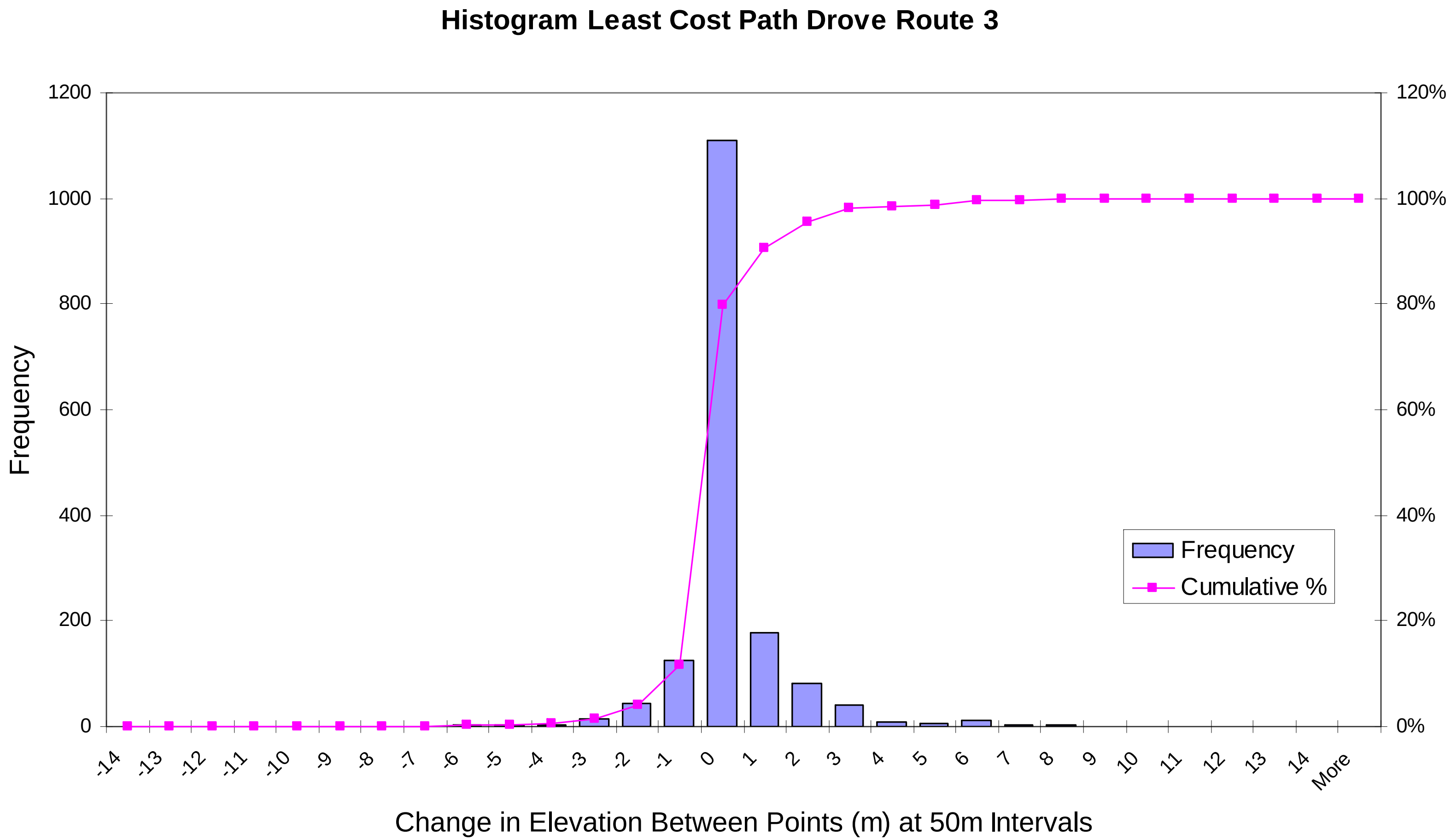


Figure 69: Drove Route 3: Histogram Least Cost

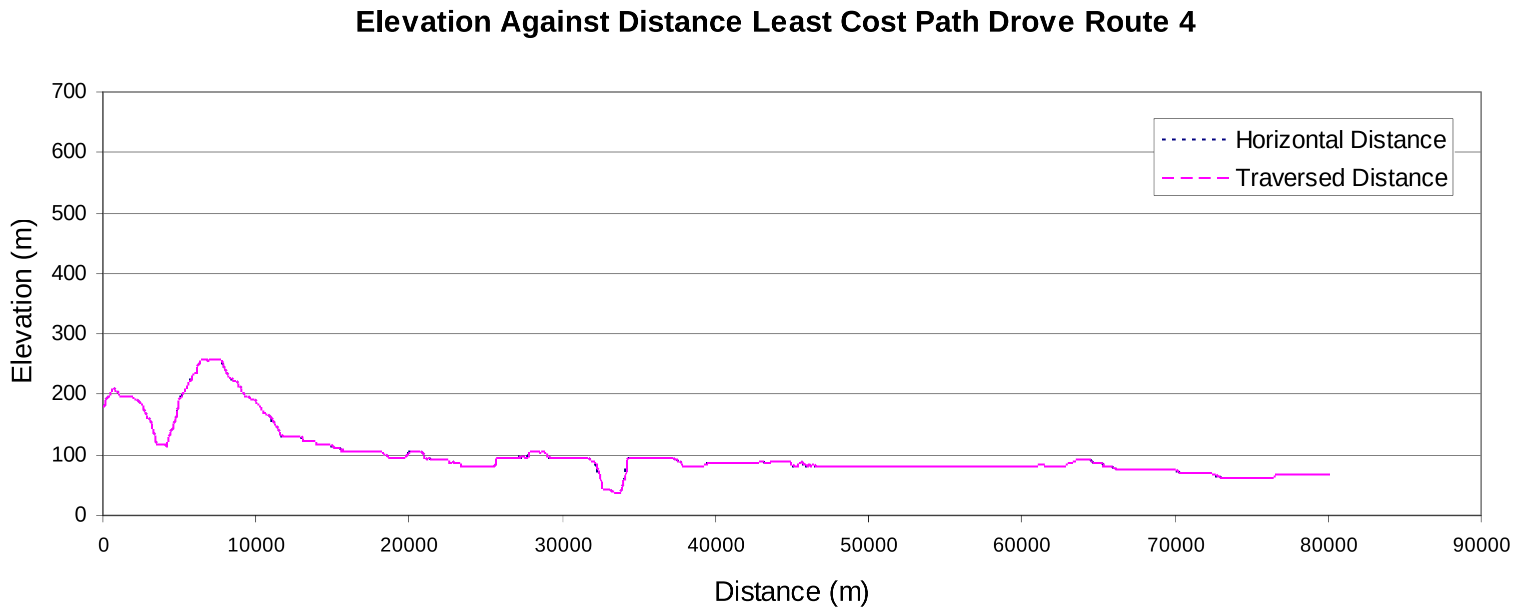


Figure 70: Drove Route 4: Elevation against Distance Least Cost

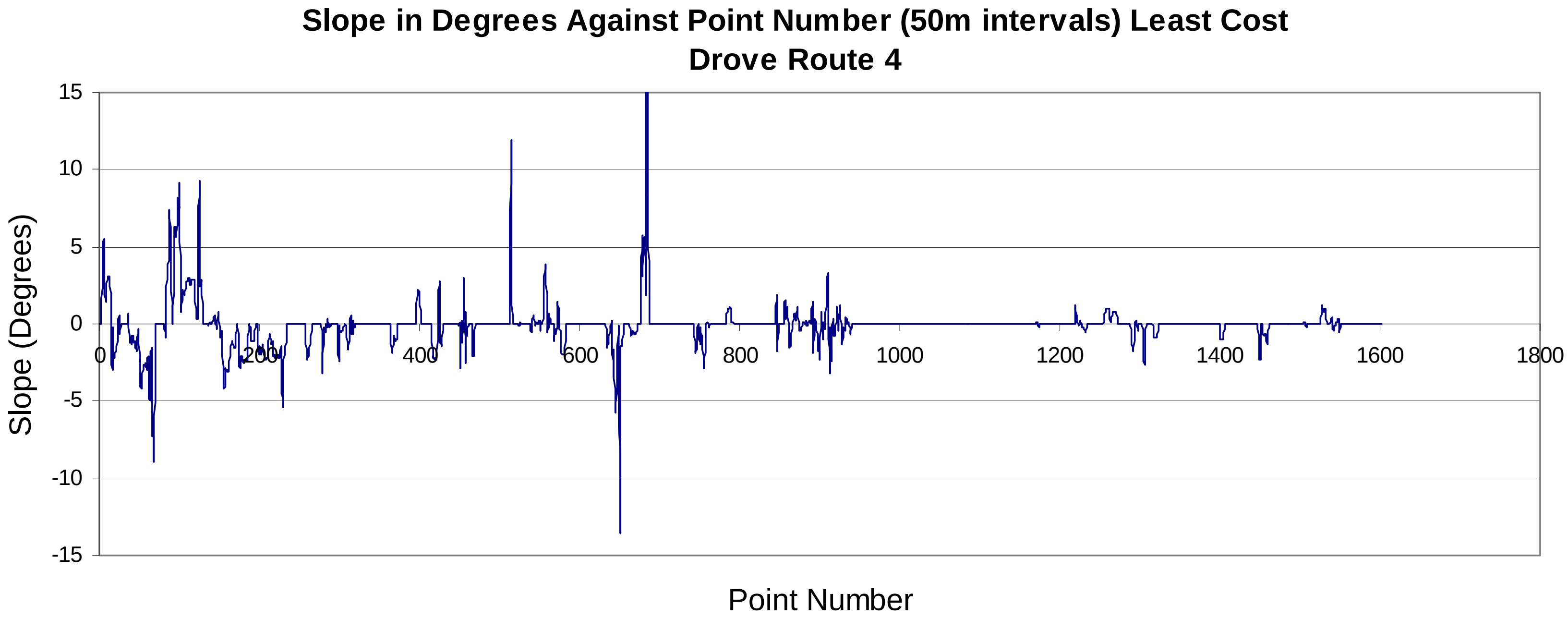


Figure 71: Drove Route 4: Slope in Degrees against Point Number Least Cost

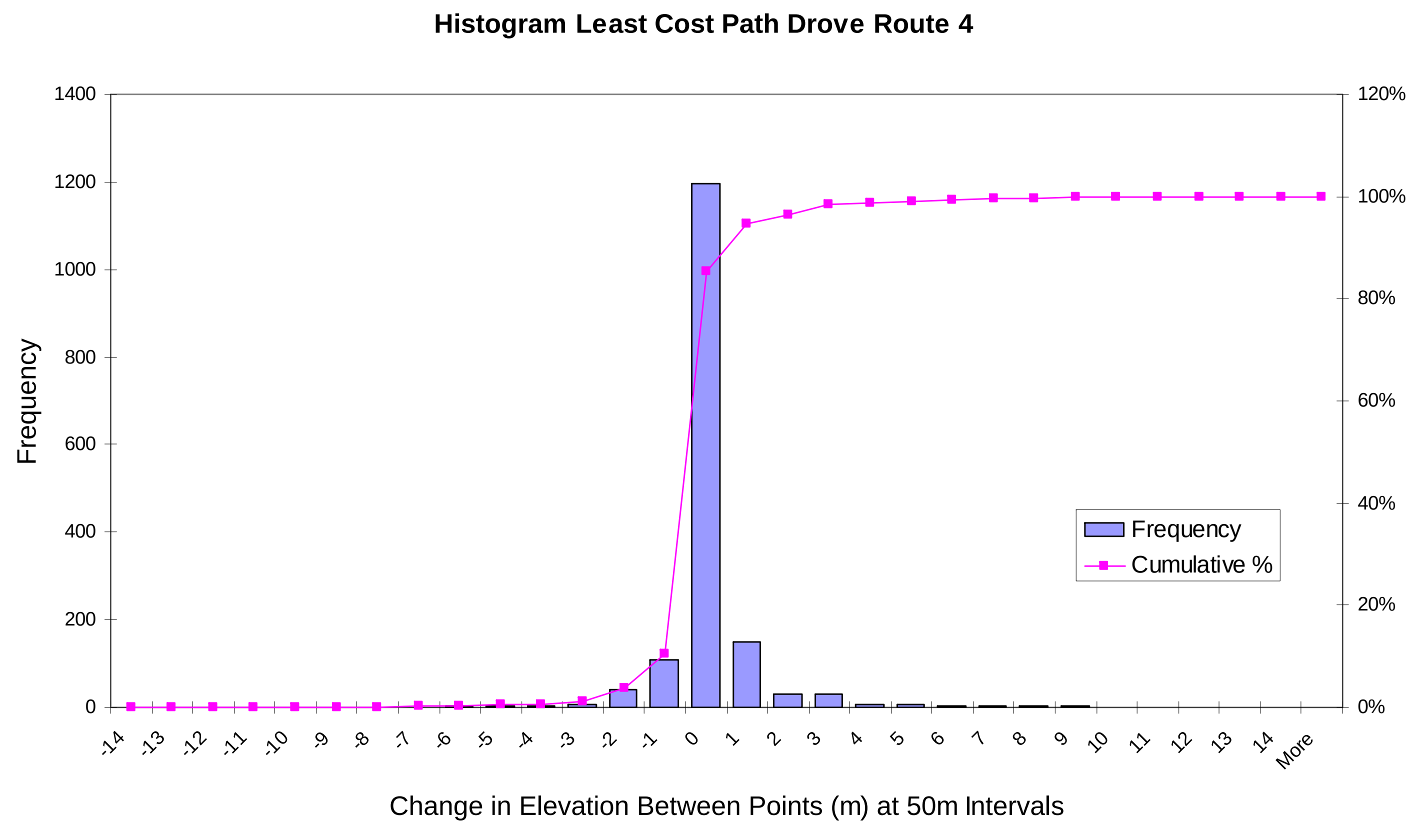


Figure 72: Drove Route 4: Histogram Least Cost

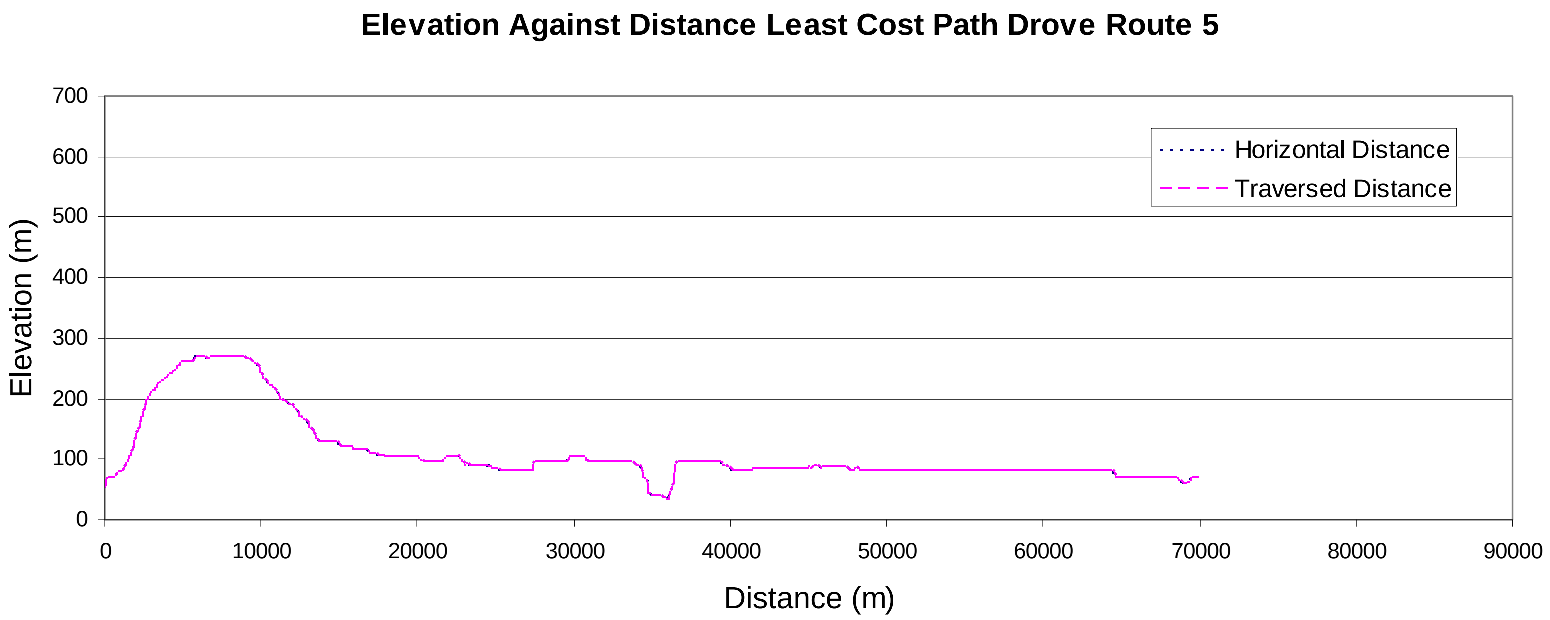


Figure 73: Drove Route 5: Elevation against Distance Least Cost

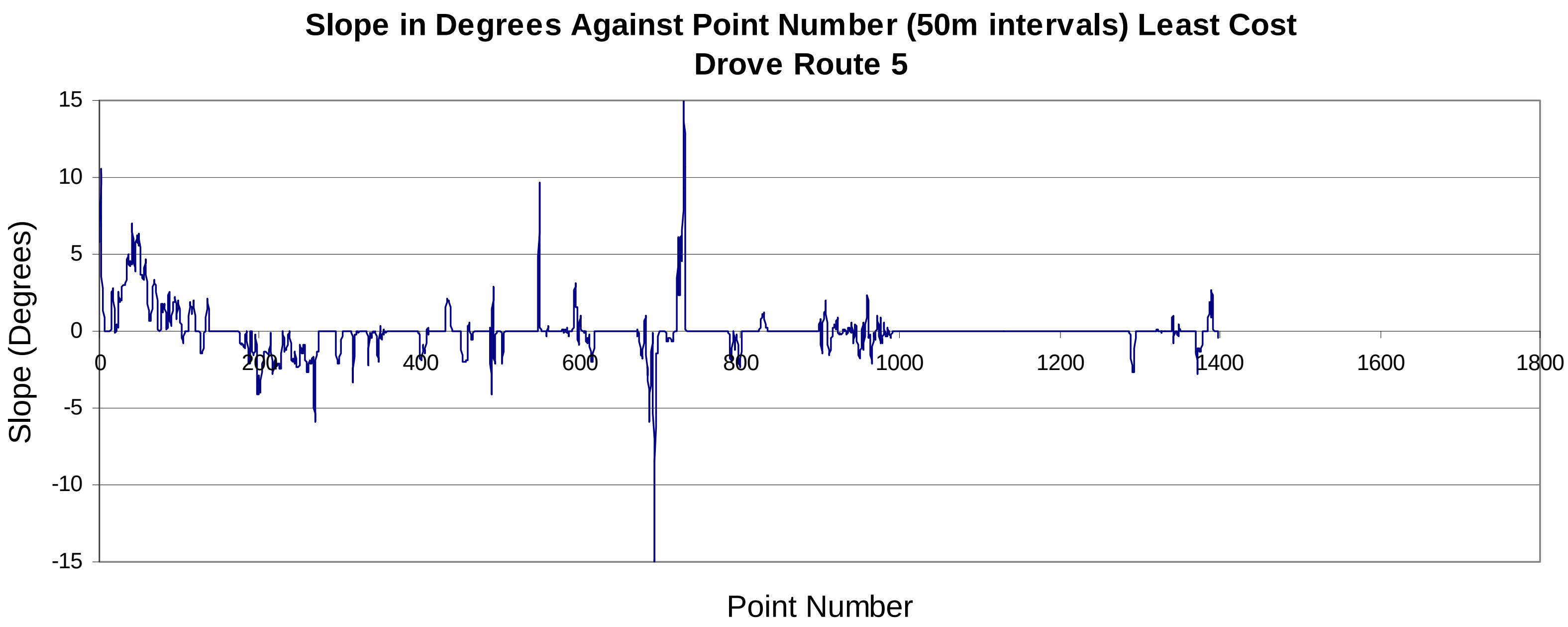


Figure 74: Drove Route 5: Slope in Degrees against Point Number Least Cost

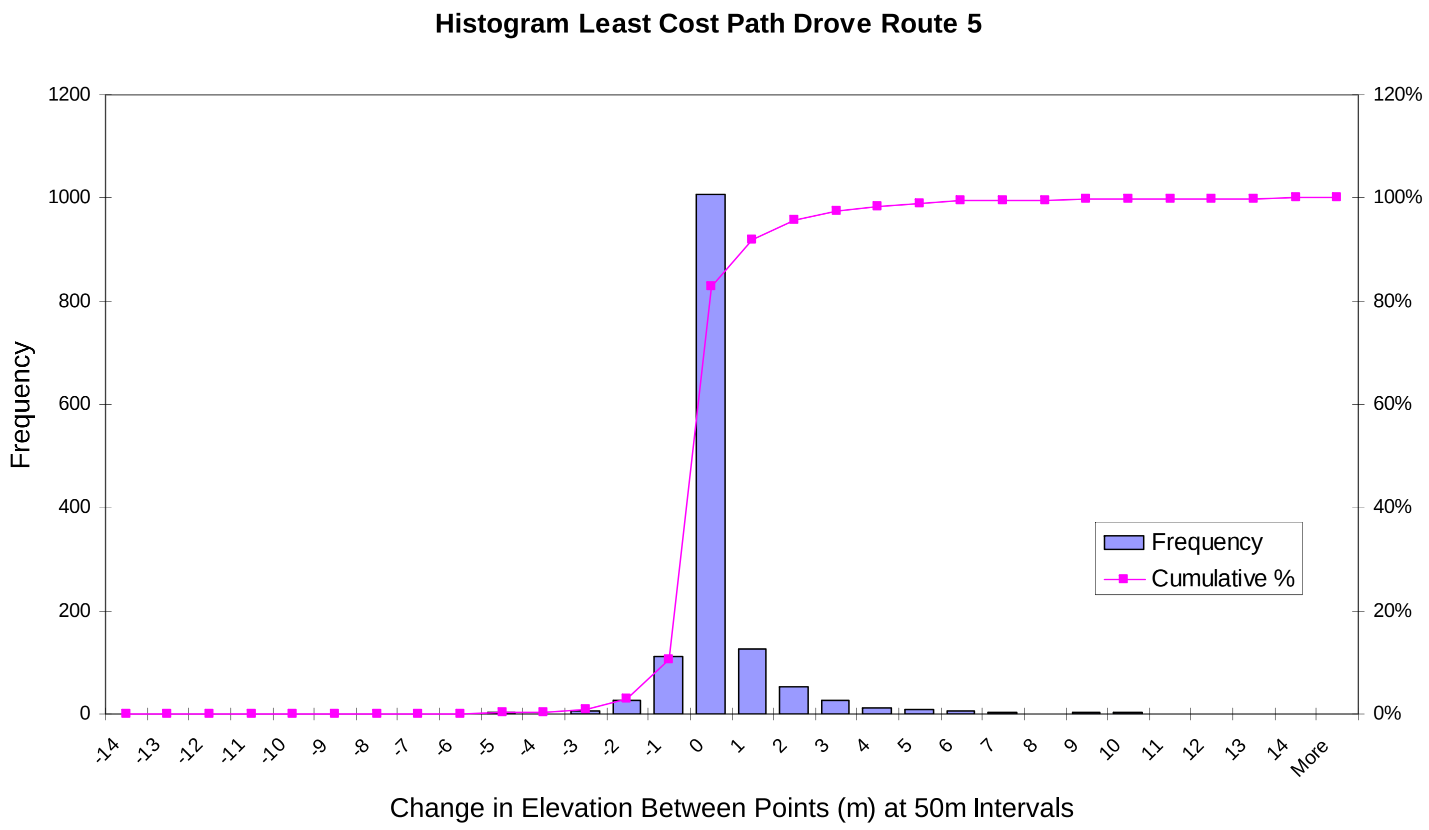


Figure 75: Drove Route 5: Histogram Least Cost

12.4.3 Land Use Types Crossed

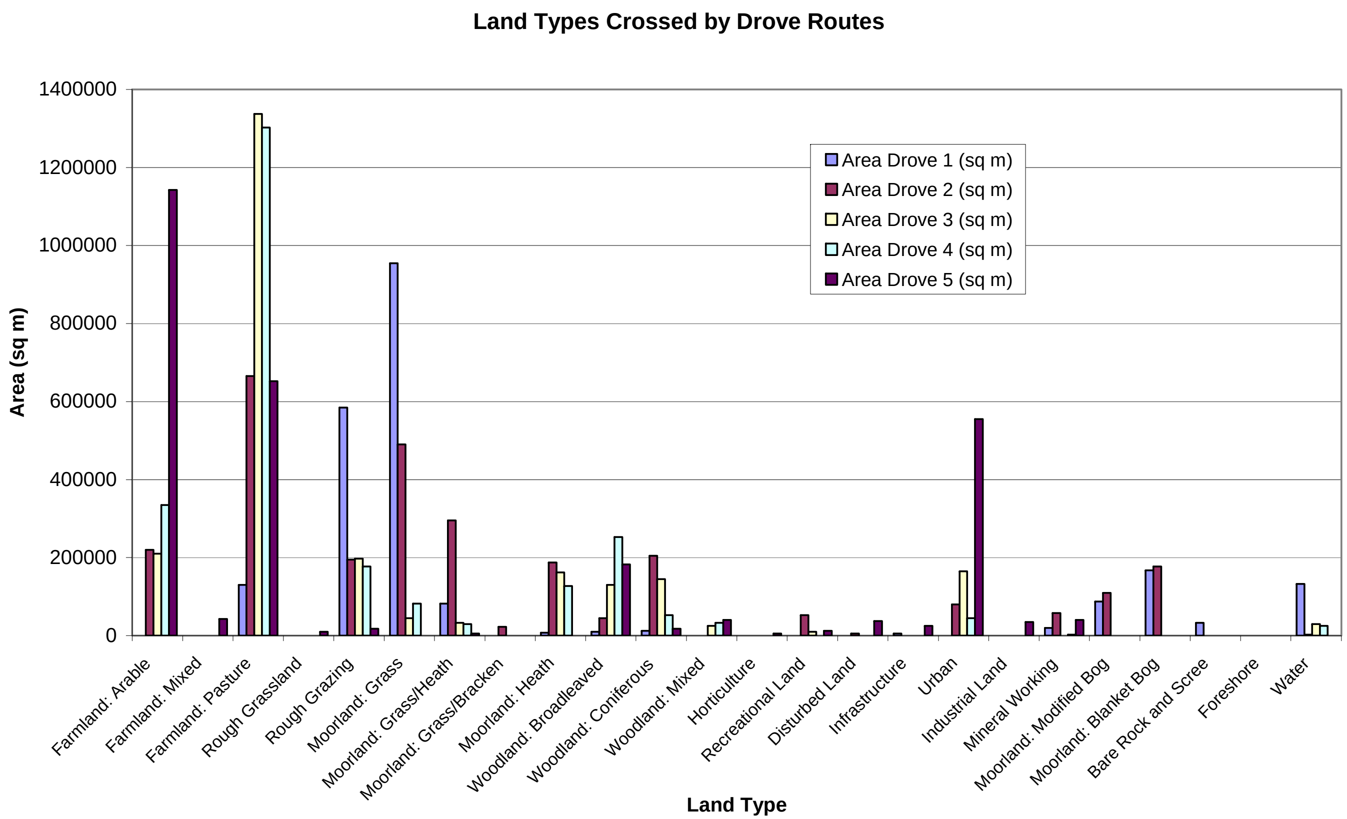


Figure 76: Land Use Types Crossed by the Drove Routes

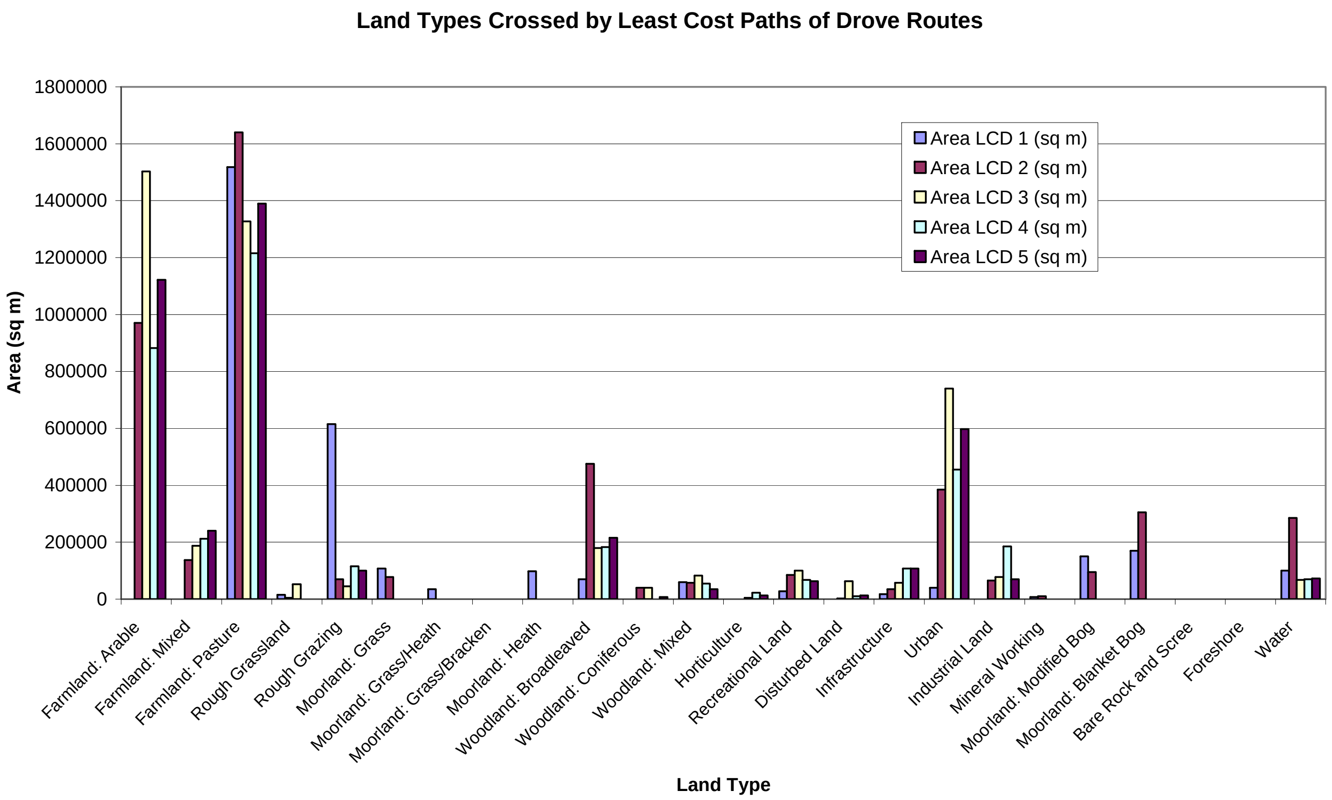


Figure 77: Land Use Types Crossed by Least Cost Drove Routes

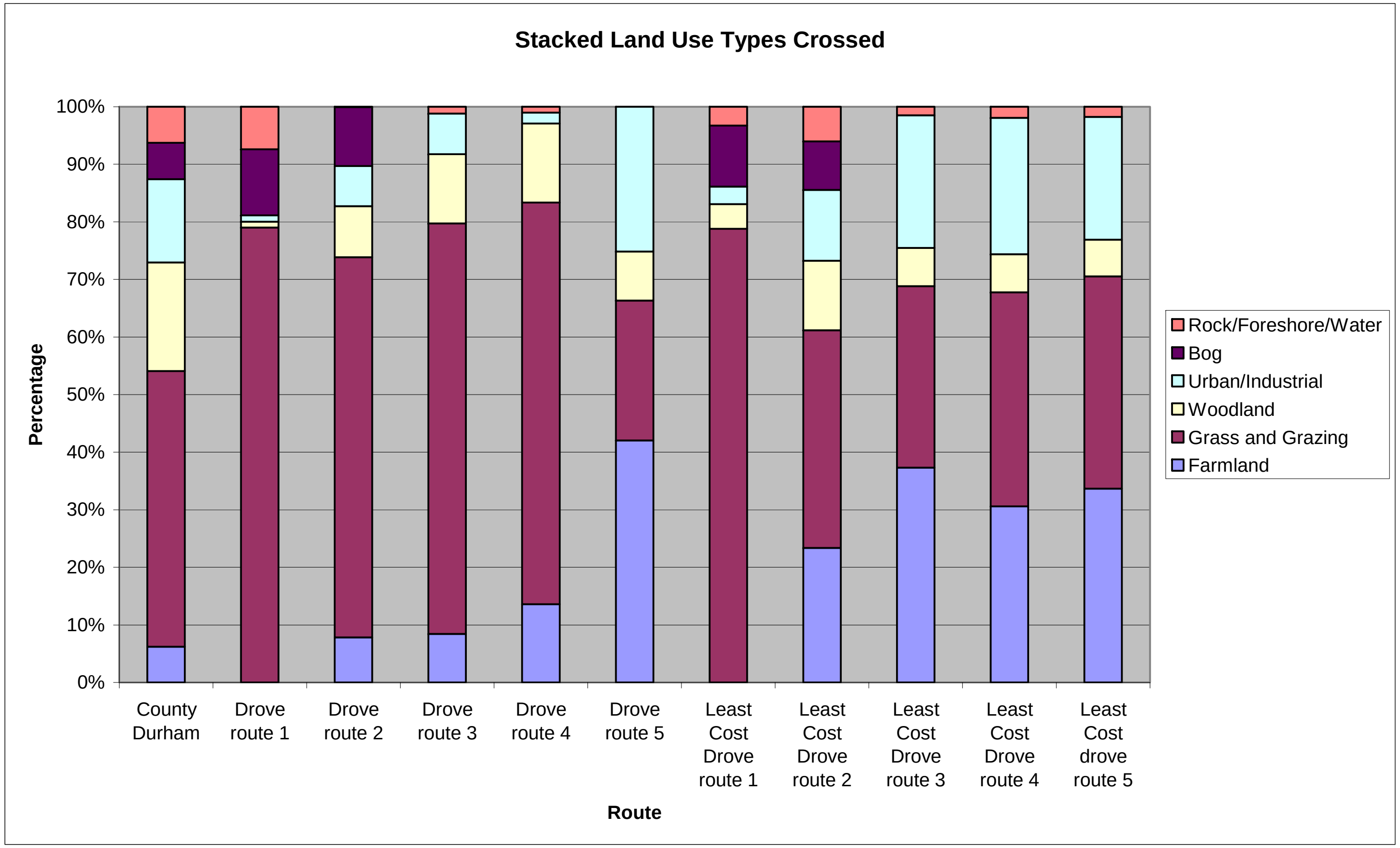


Figure 78: Stacked Land Use Types Crossed For the Drove Routes and their Least Cost Routes.

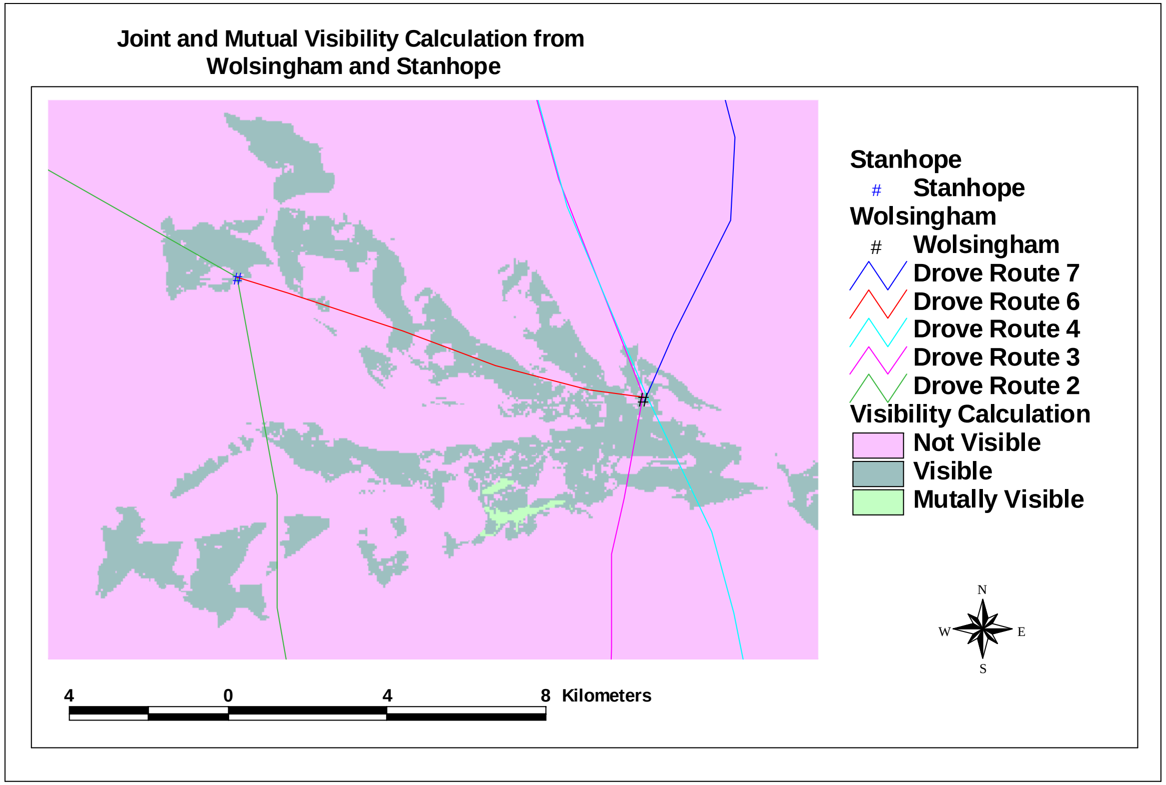


Figure 79: Drove Routes 2, 3, 4, 6 and 7. Joint and Mutual Visibility from Wolsingham and Stanhope, County Durham

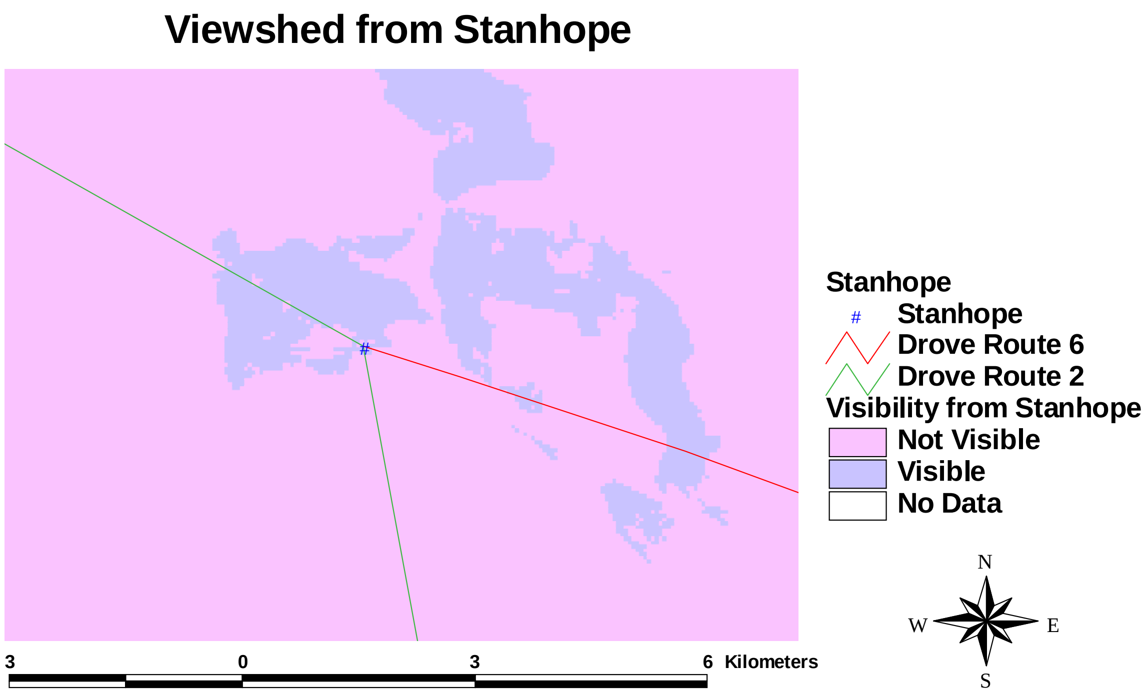


Figure 80: Viewshed from Stanhope

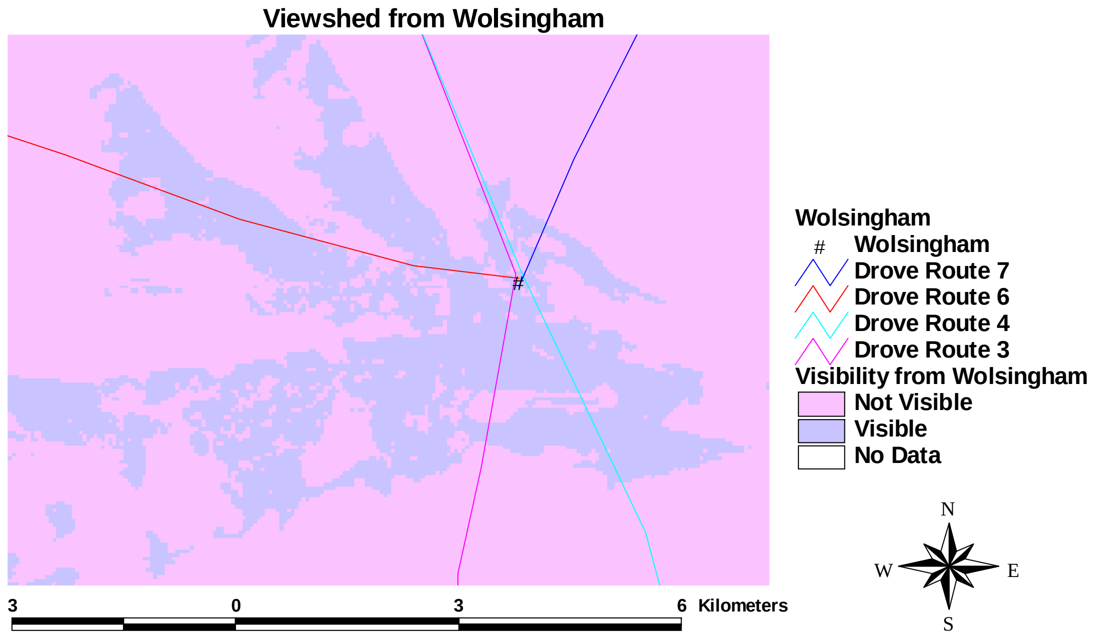


Figure 81: Viewshed From Wolsingham

12.5 Illustrations for Chapter 6: Lead Routes

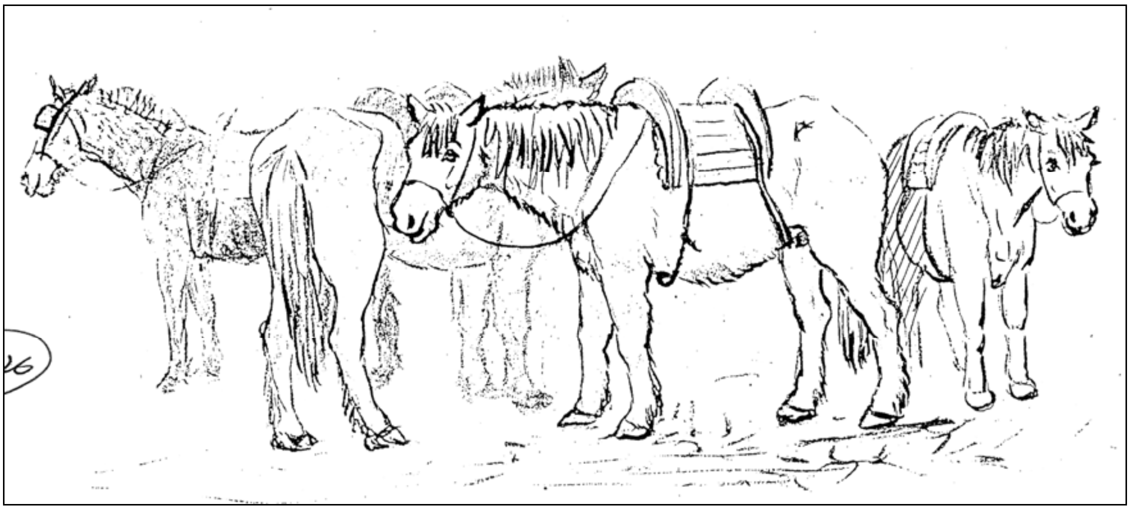


Figure 82 Pack Horses Ready to be Loaded.

From a collection of 19th century sketches now held in the Science Museum's Science and Society Picture Library.

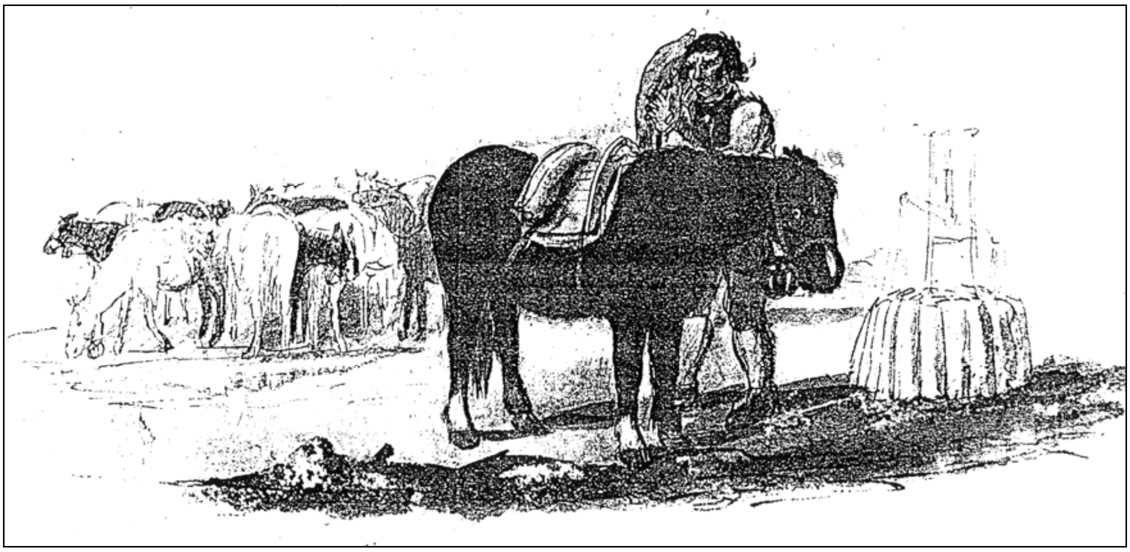


Figure 83 Pack Horse being Loaded with the 'Pokes'.

From a collection of 19th century sketches now held in the Science Museum's Science and Society Picture Library.

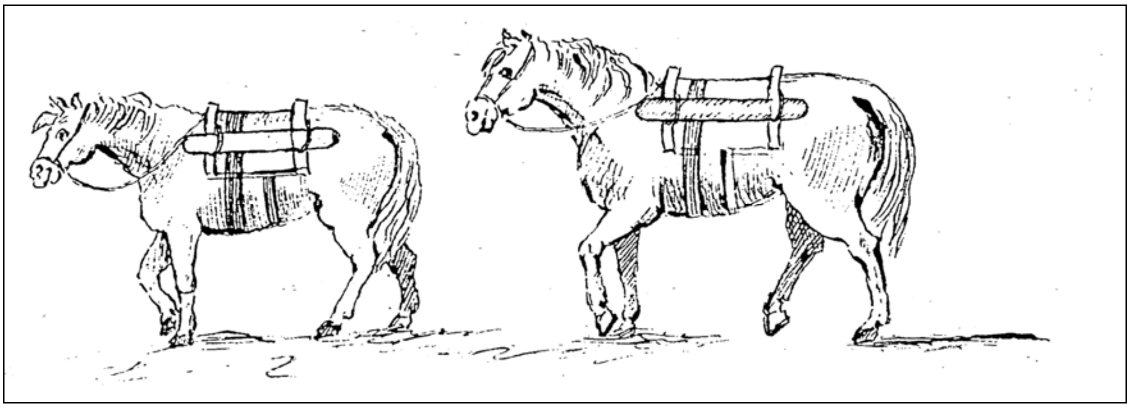


Figure 84 Pack Horses Loaded with the Lead Ingots (pigs).

From a collection of 19th century sketches now held in the Science Museum's Science and Society Picture Library.

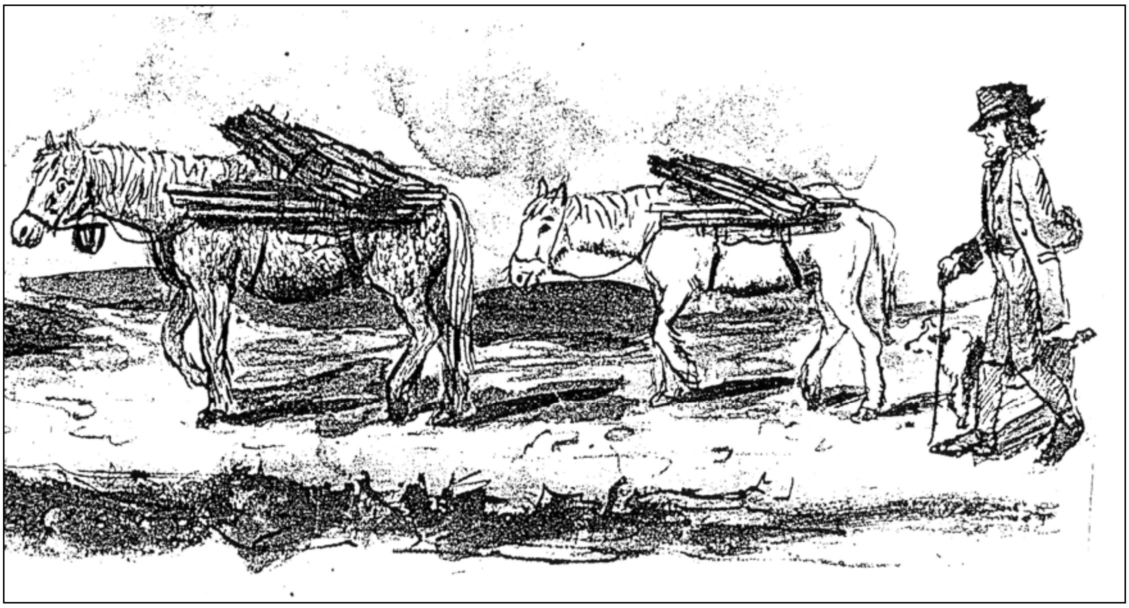


Figure 85 The Pack Horses Loaded with Wood on Their Return Journey.

From a collection of 19th century sketches now held in the Science Museum's Science and Society Picture Library.

Figure 86: The Saddle House at Egglesburn, County Durham

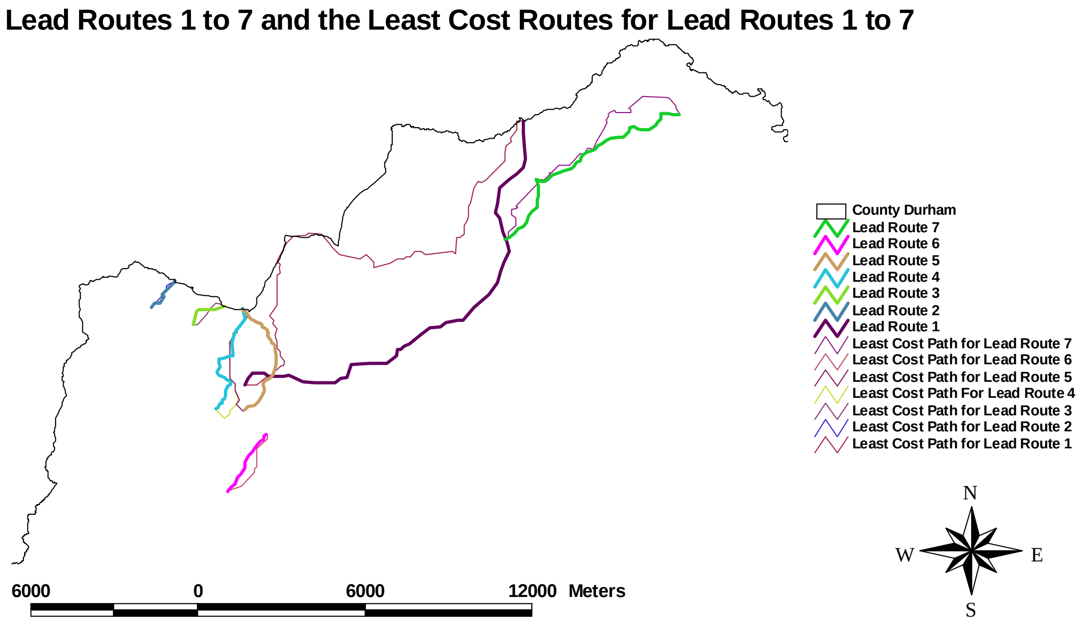


Figure 87: Lead Routes 1 to 7 and the Least Cost Routes for Lead routes 1 to 7

12.5.1 Lead Routes

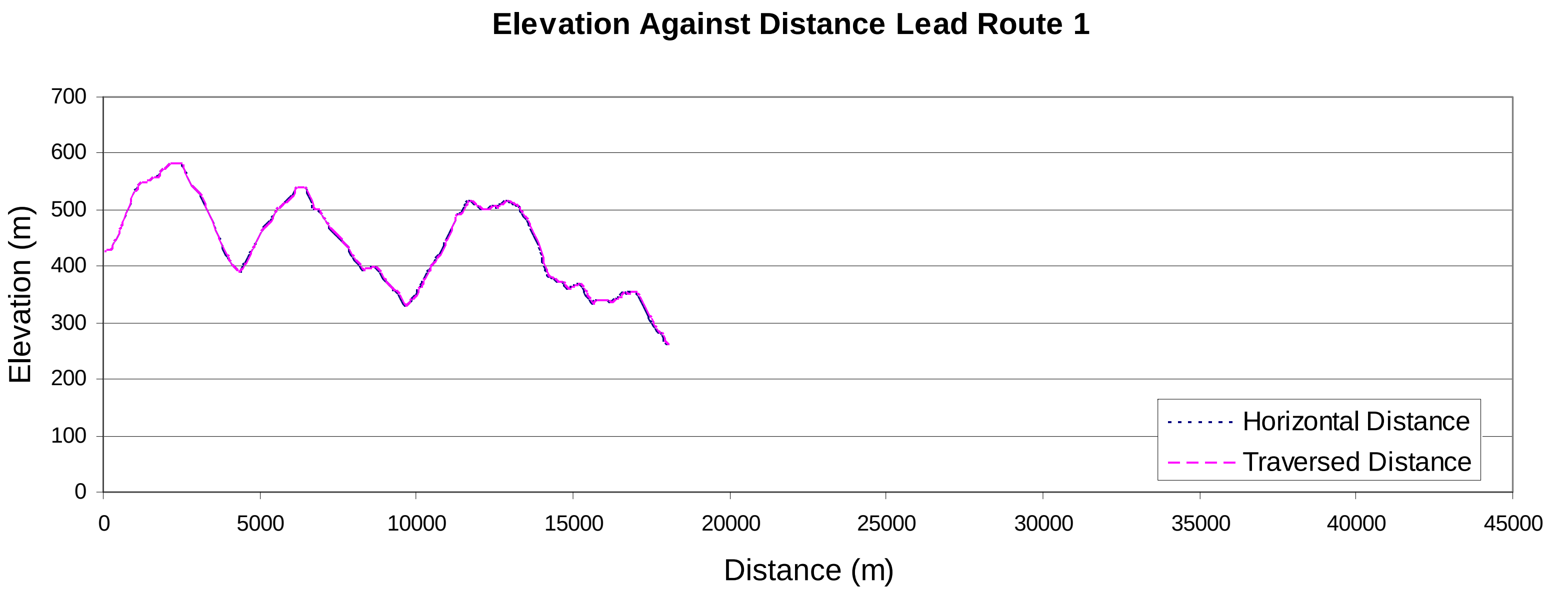


Figure 88: Lead Route 1: Elevation against Distance

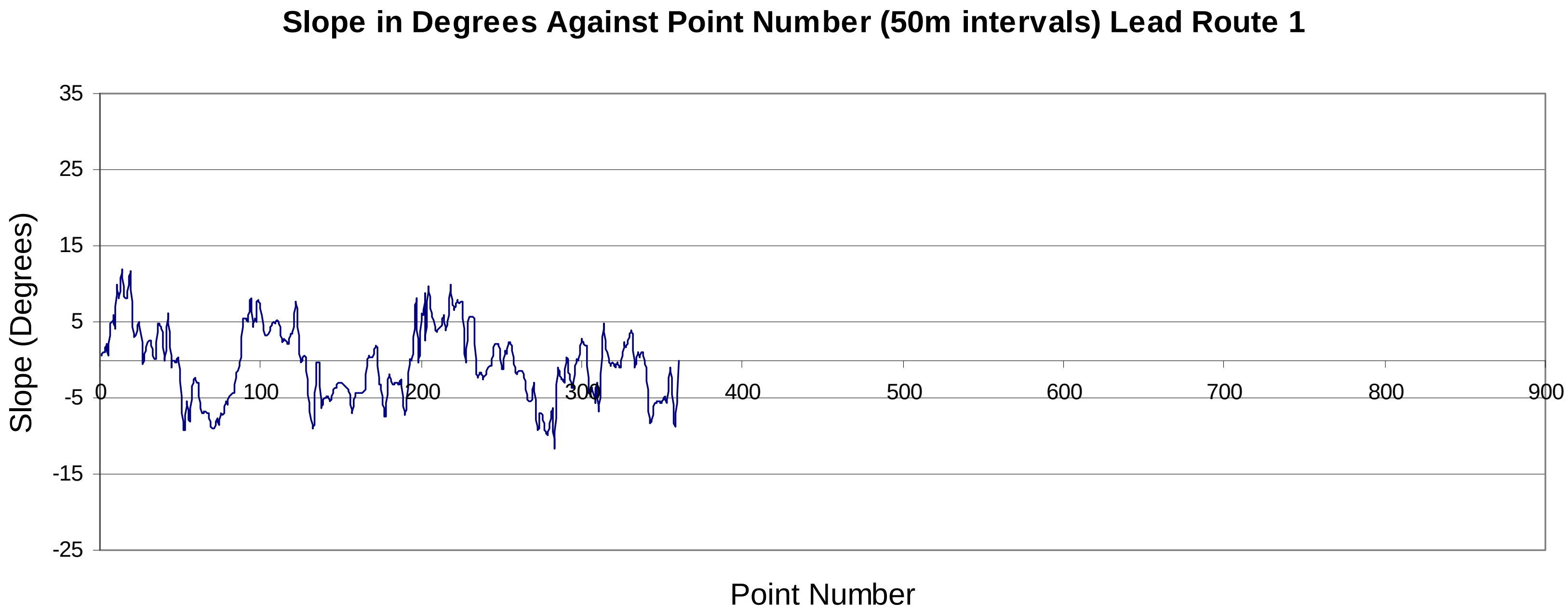


Figure 89: Lead Route 1: Slope in Degrees against Point Number

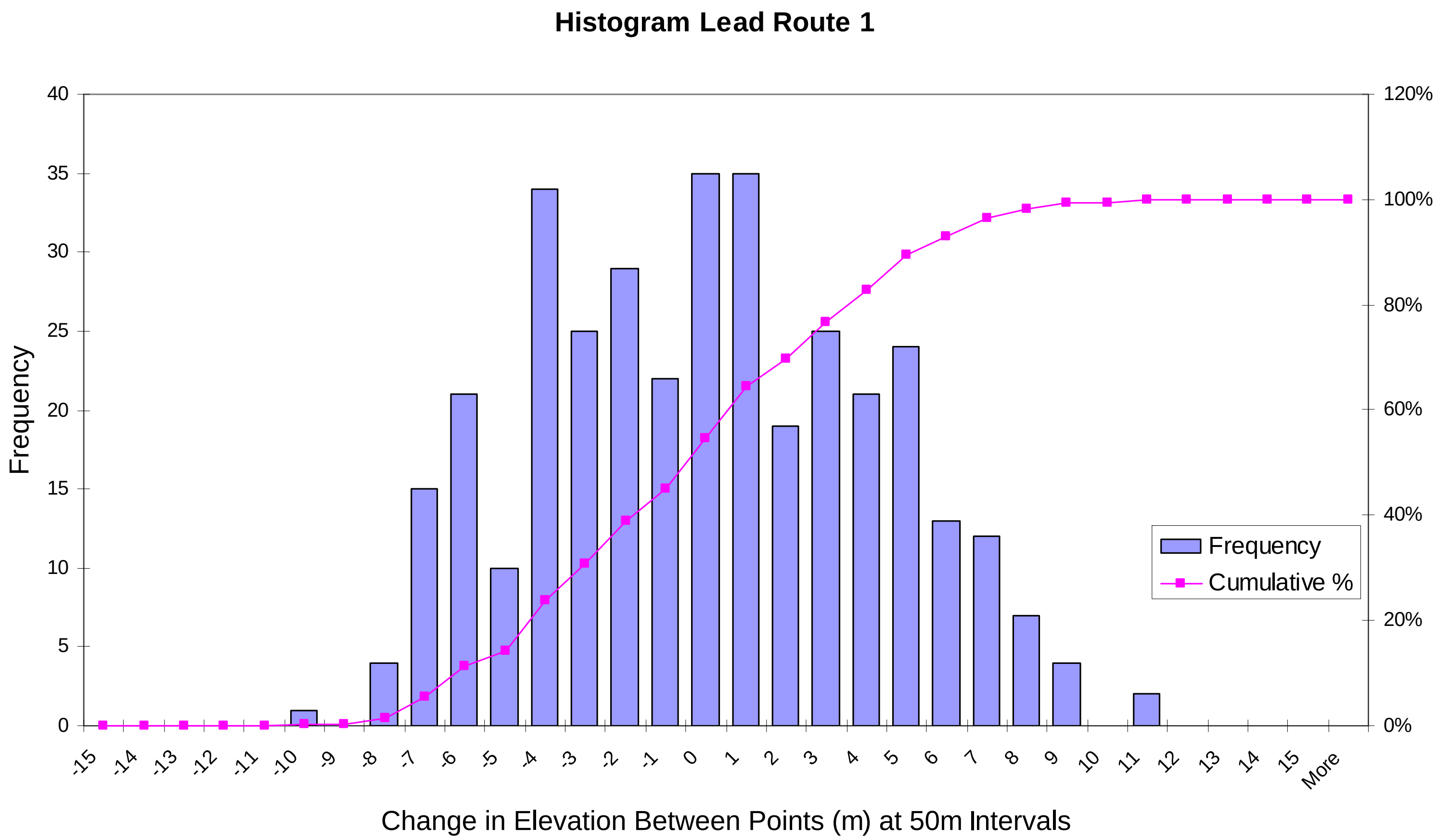


Figure 90: Lead Route 1: Histogram Lead

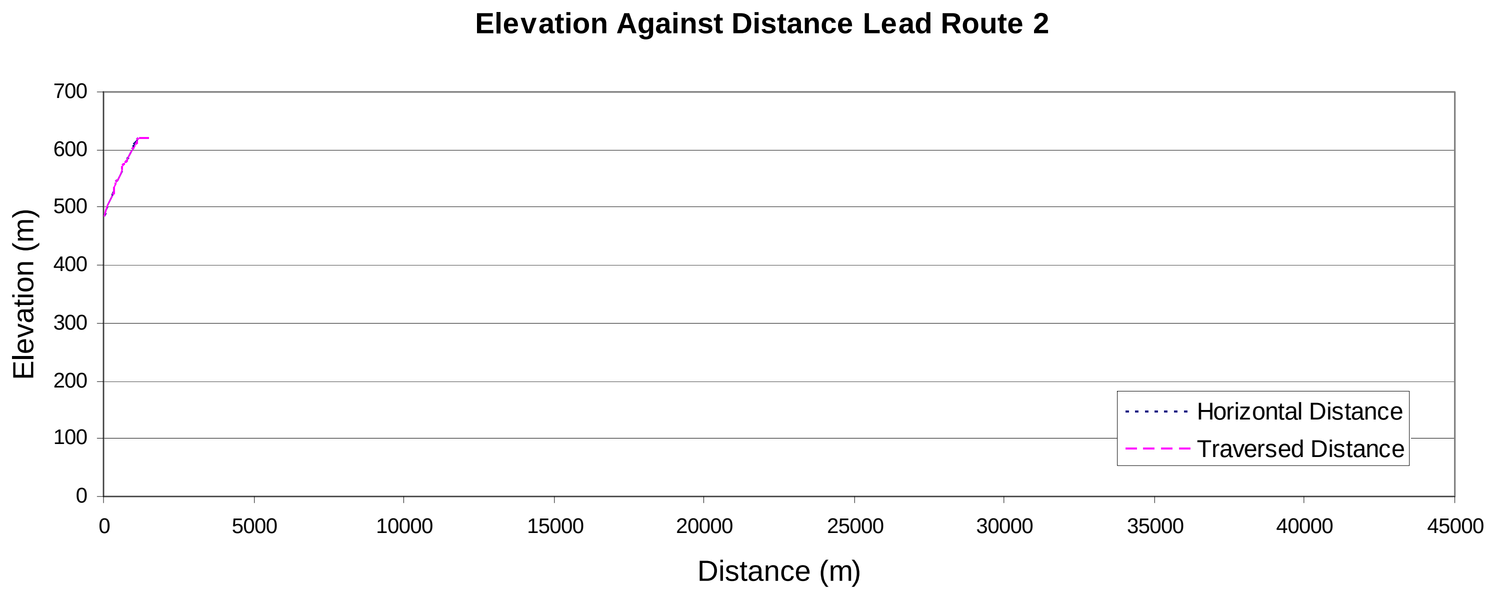


Figure 91: Lead Route 2: Elevation against Distance

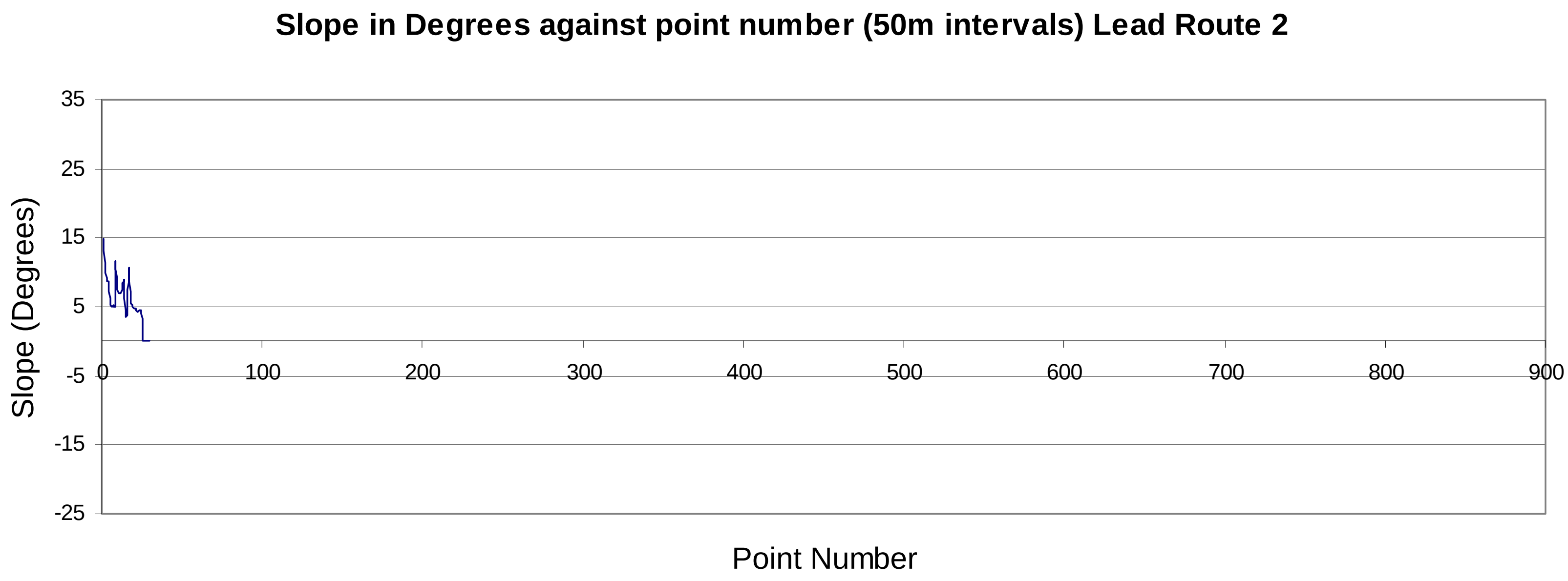


Figure 92: Lead Route 2: Slope in Degrees against Point Number

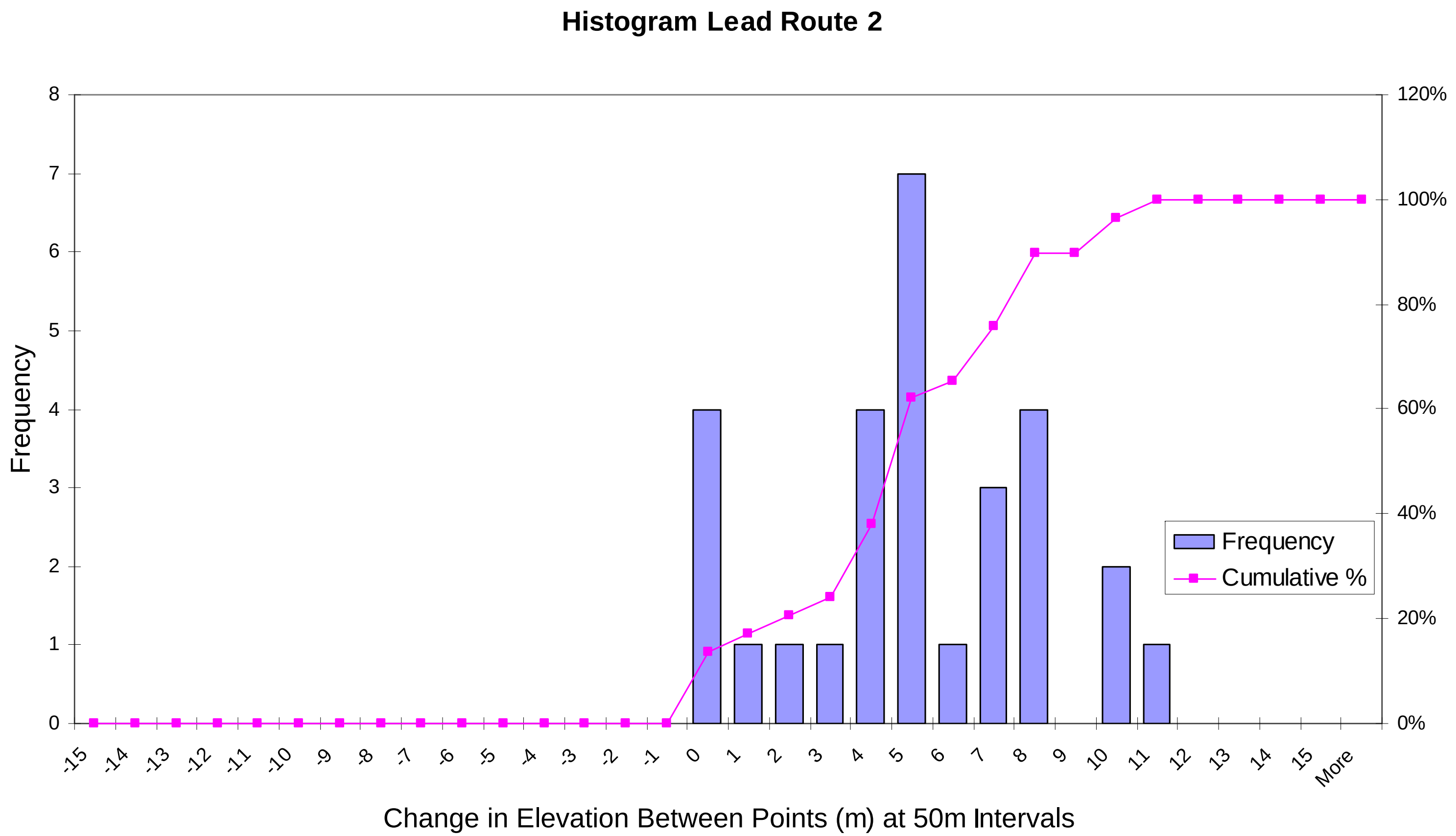


Figure 93: Lead Route 2: Histogram

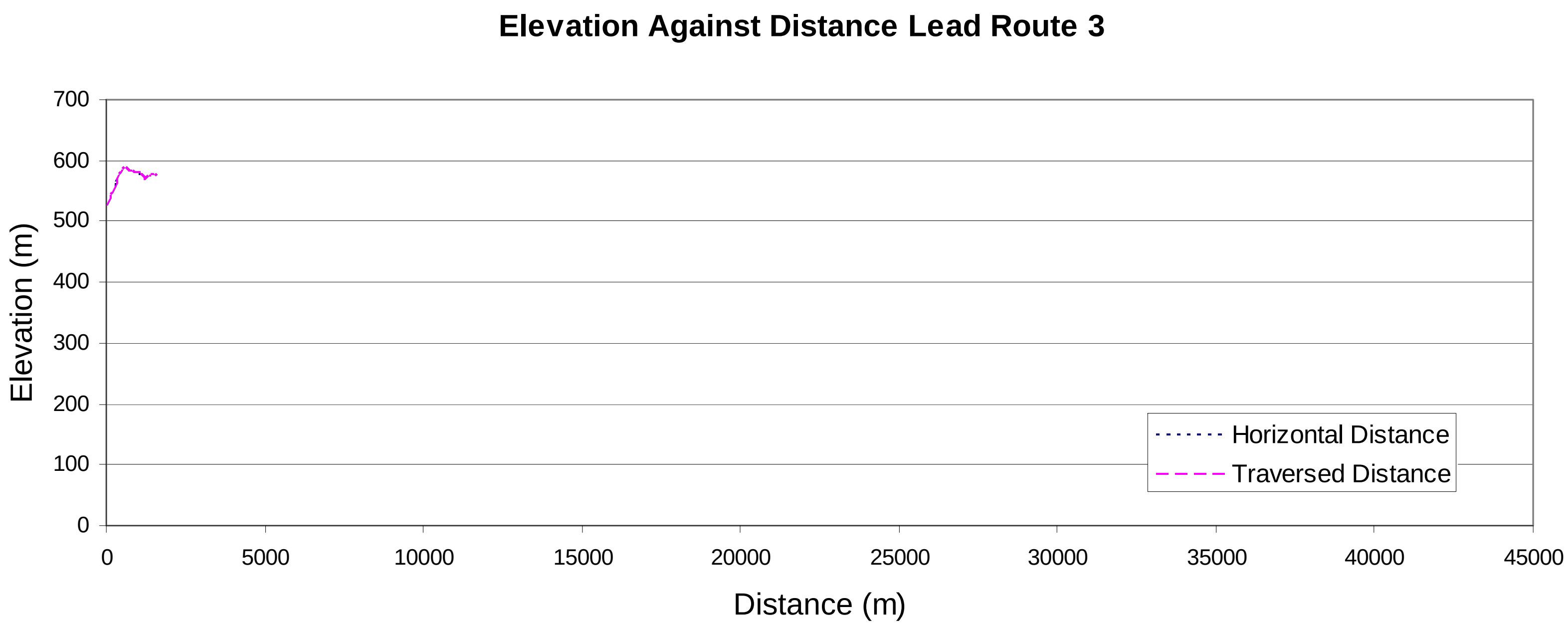


Figure 94: Lead Route 3: Elevation against Distance

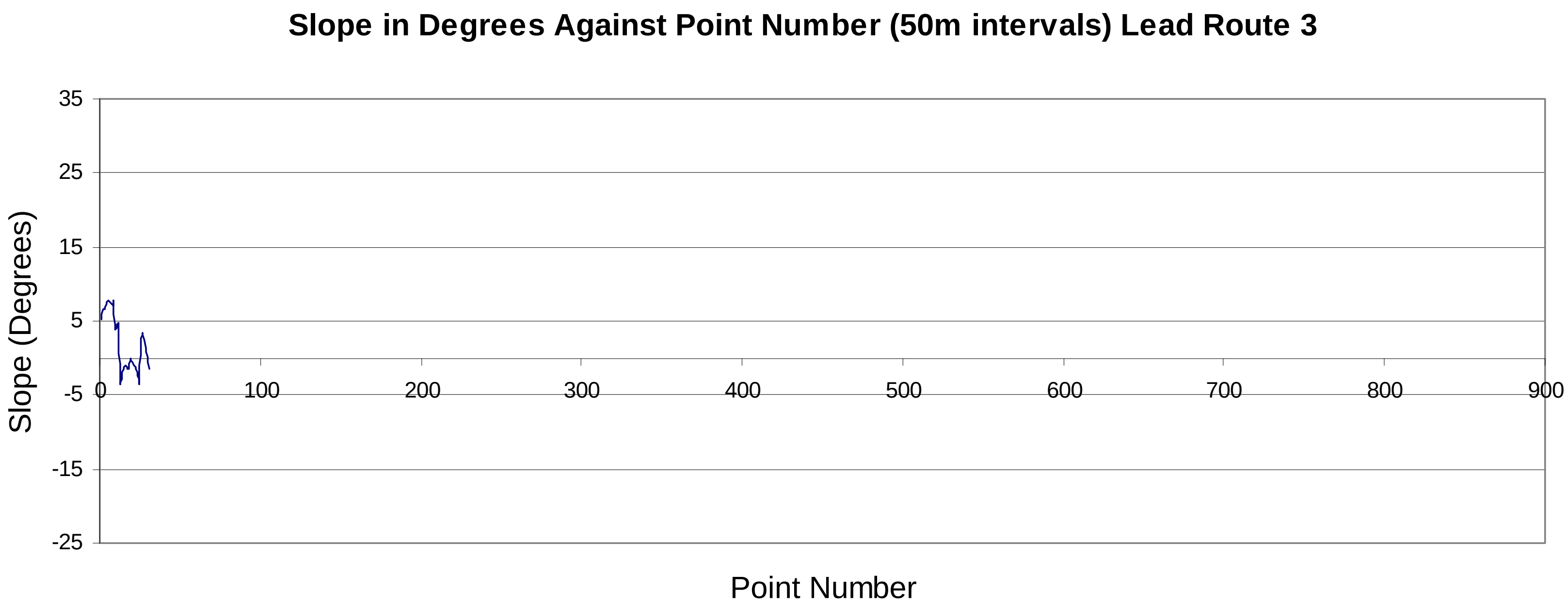


Figure 95: Lead Route 3: Slope in Degrees against Point Number

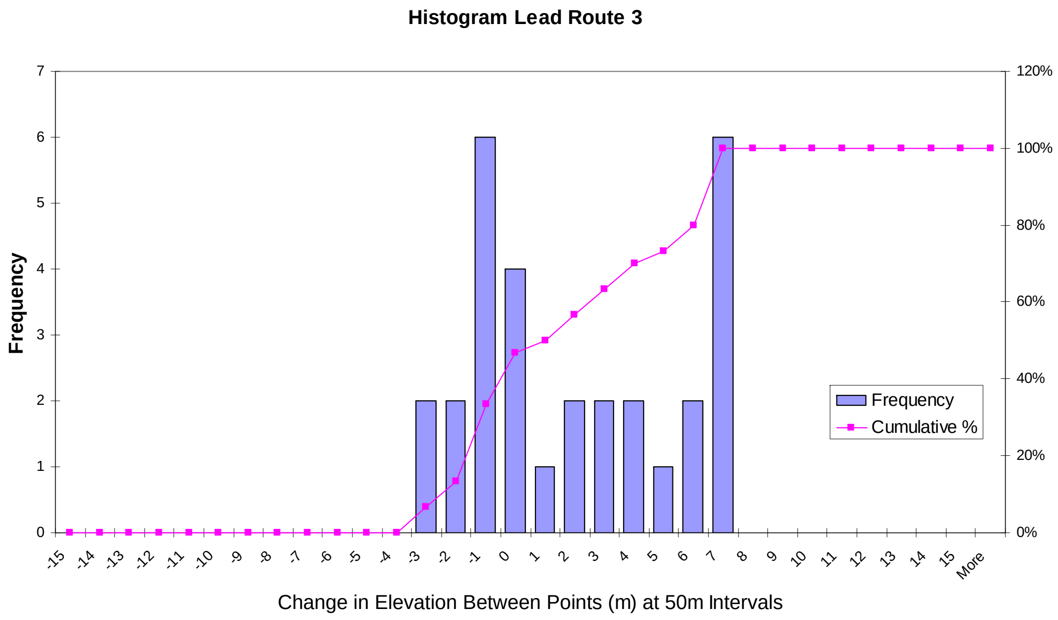


Figure 96: Lead Route 3: Histogram

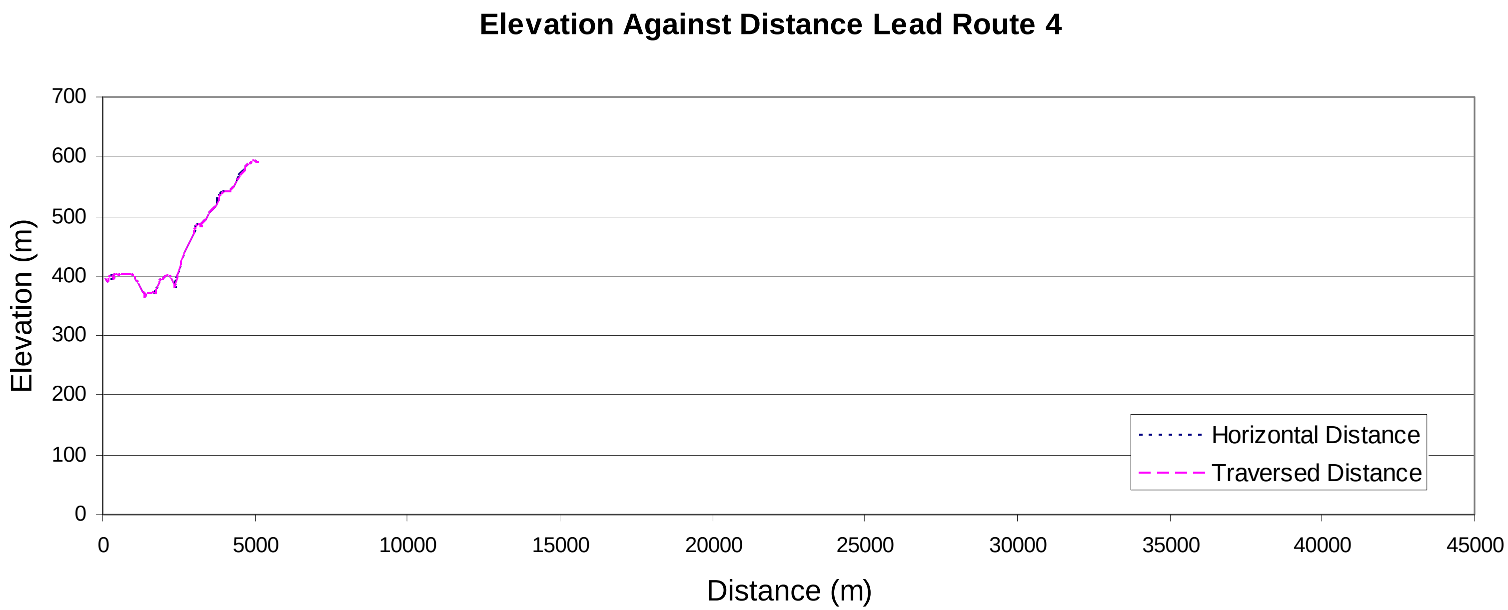


Figure 97: Lead Route 4: Elevation against Distance

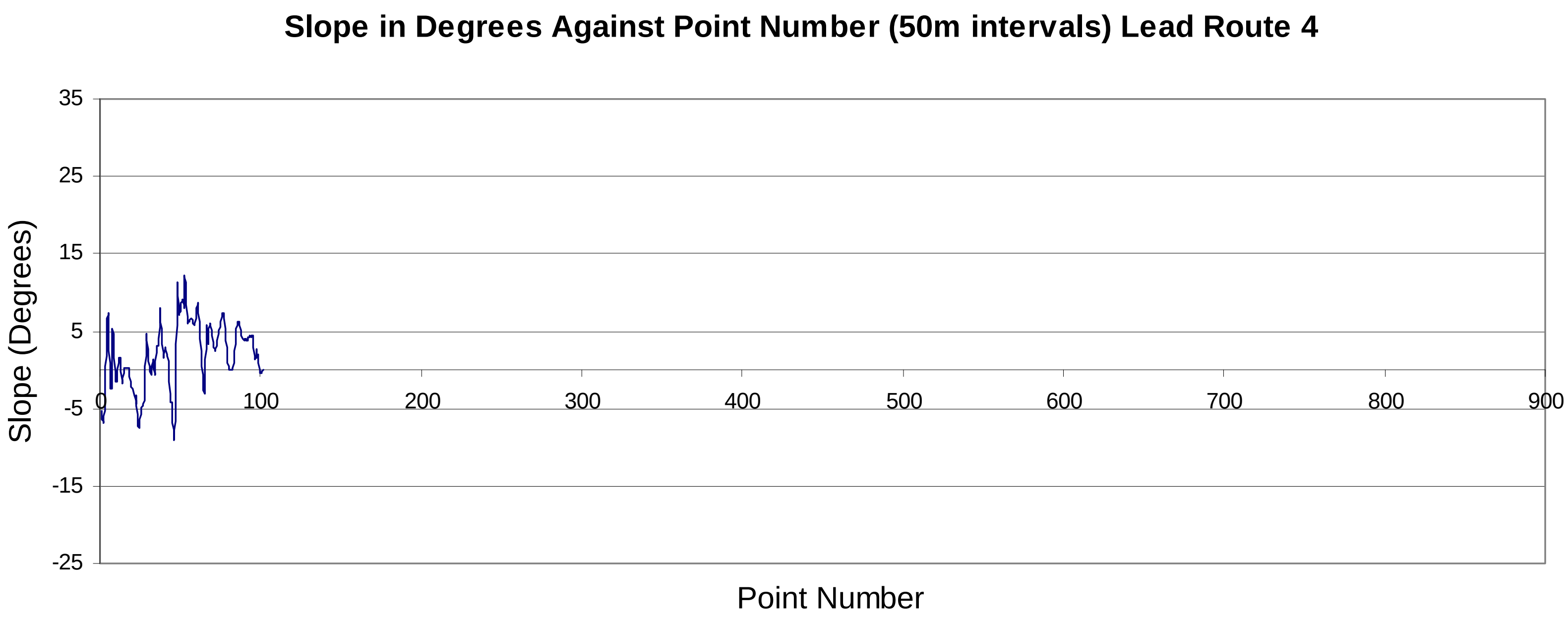


Figure 98: Lead Route 4: Slope in Degrees against Point Number

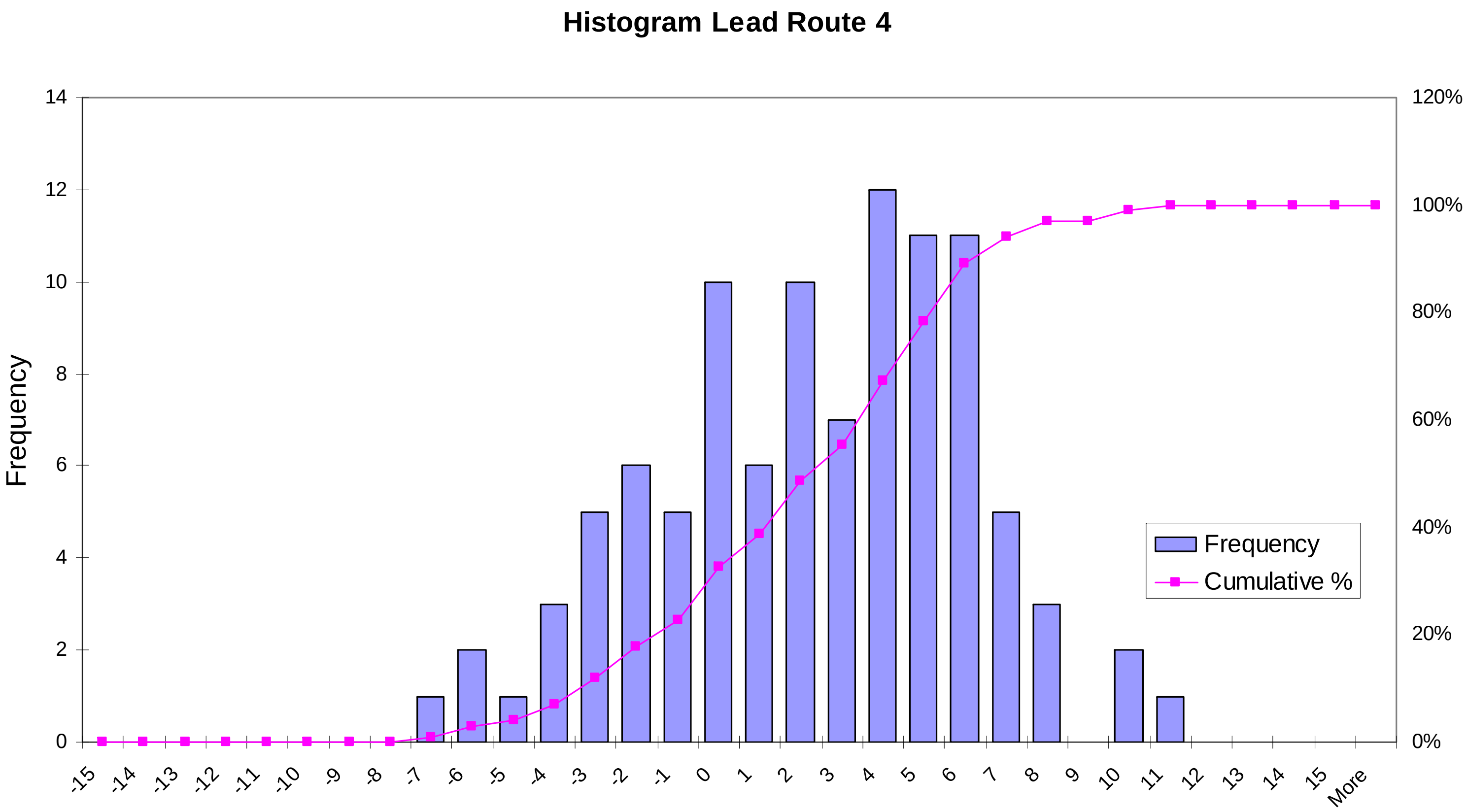


Figure 99: Lead Route 4: Histogram

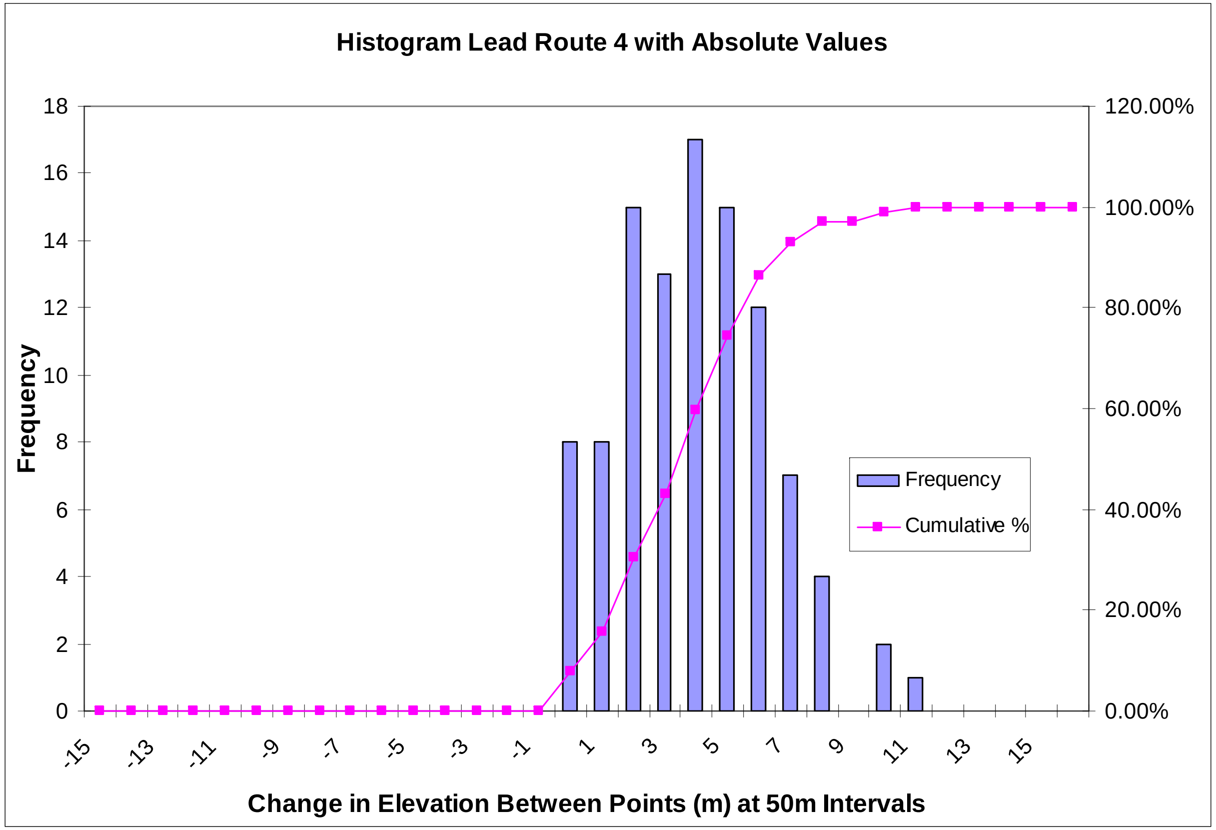


Figure 100: Histogram Lead Route 4 with Absolute Values

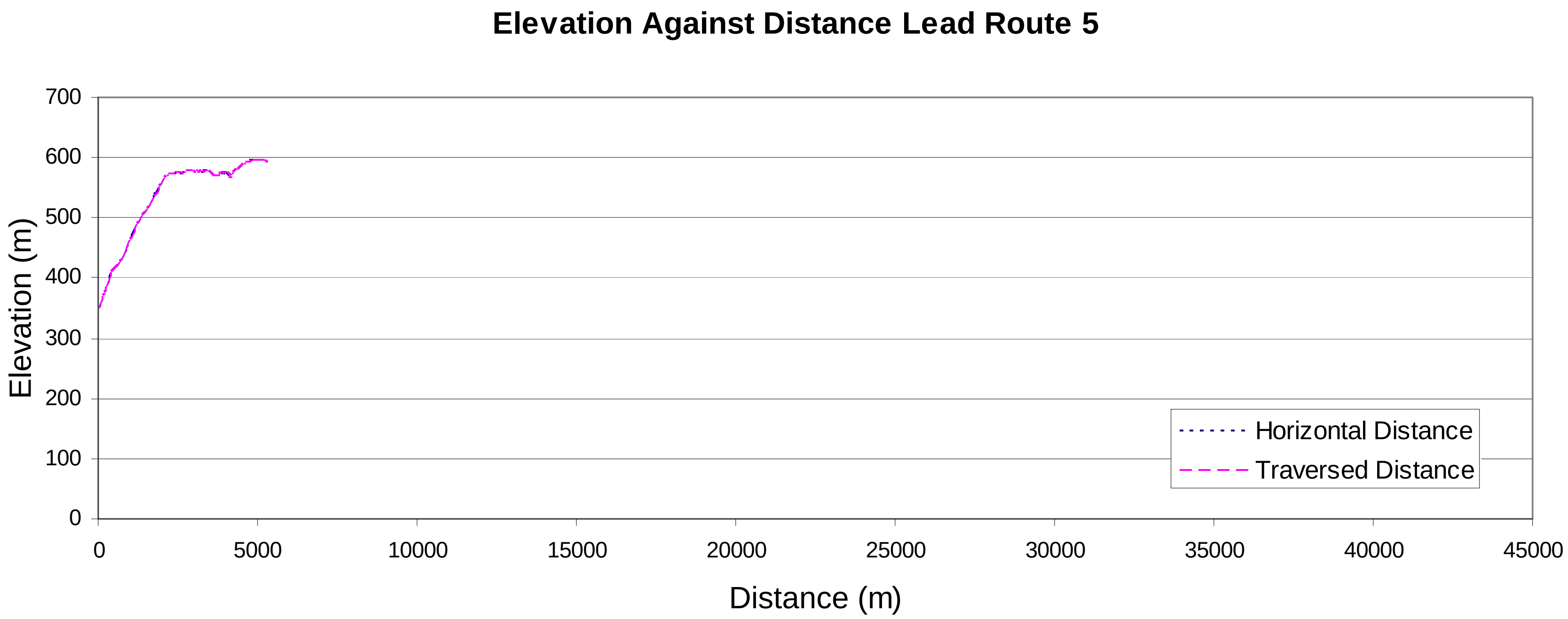


Figure 101: Lead Route 5: Elevation against Distance

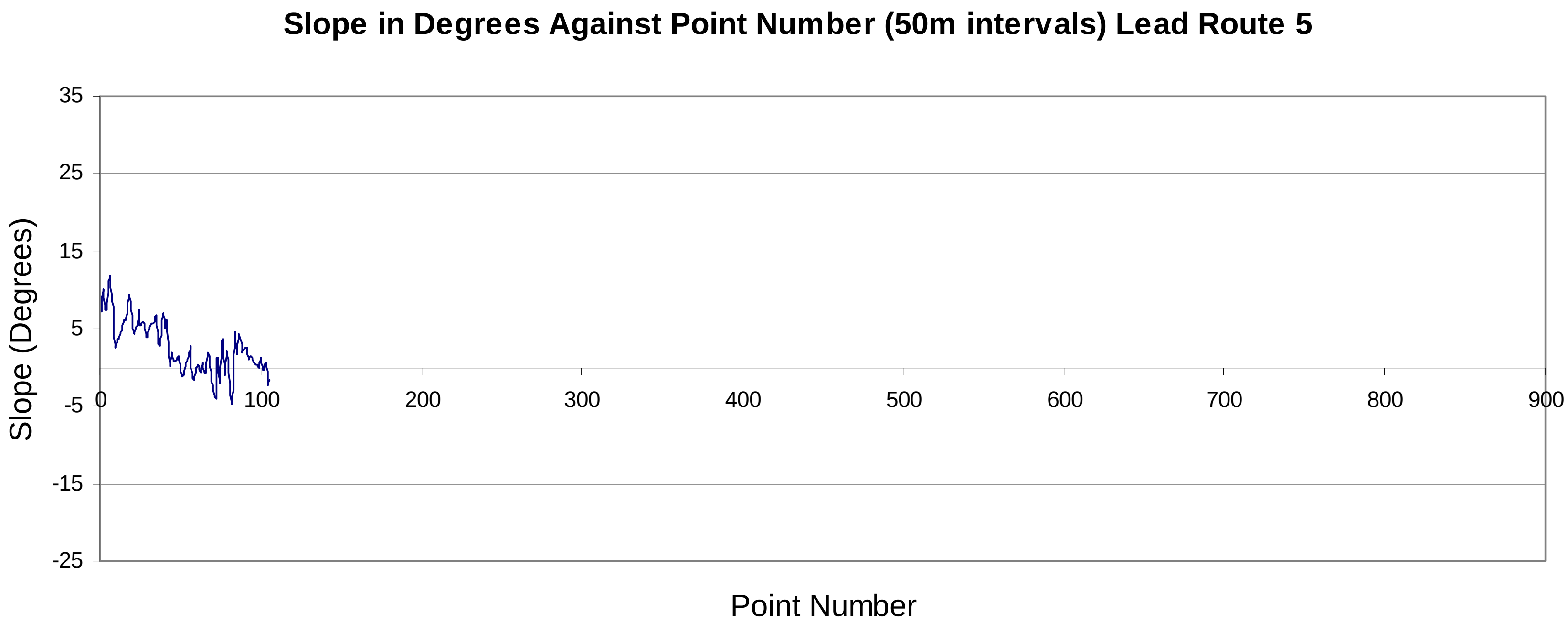


Figure 102: Lead Route 5: Slope in Degrees against Point Number

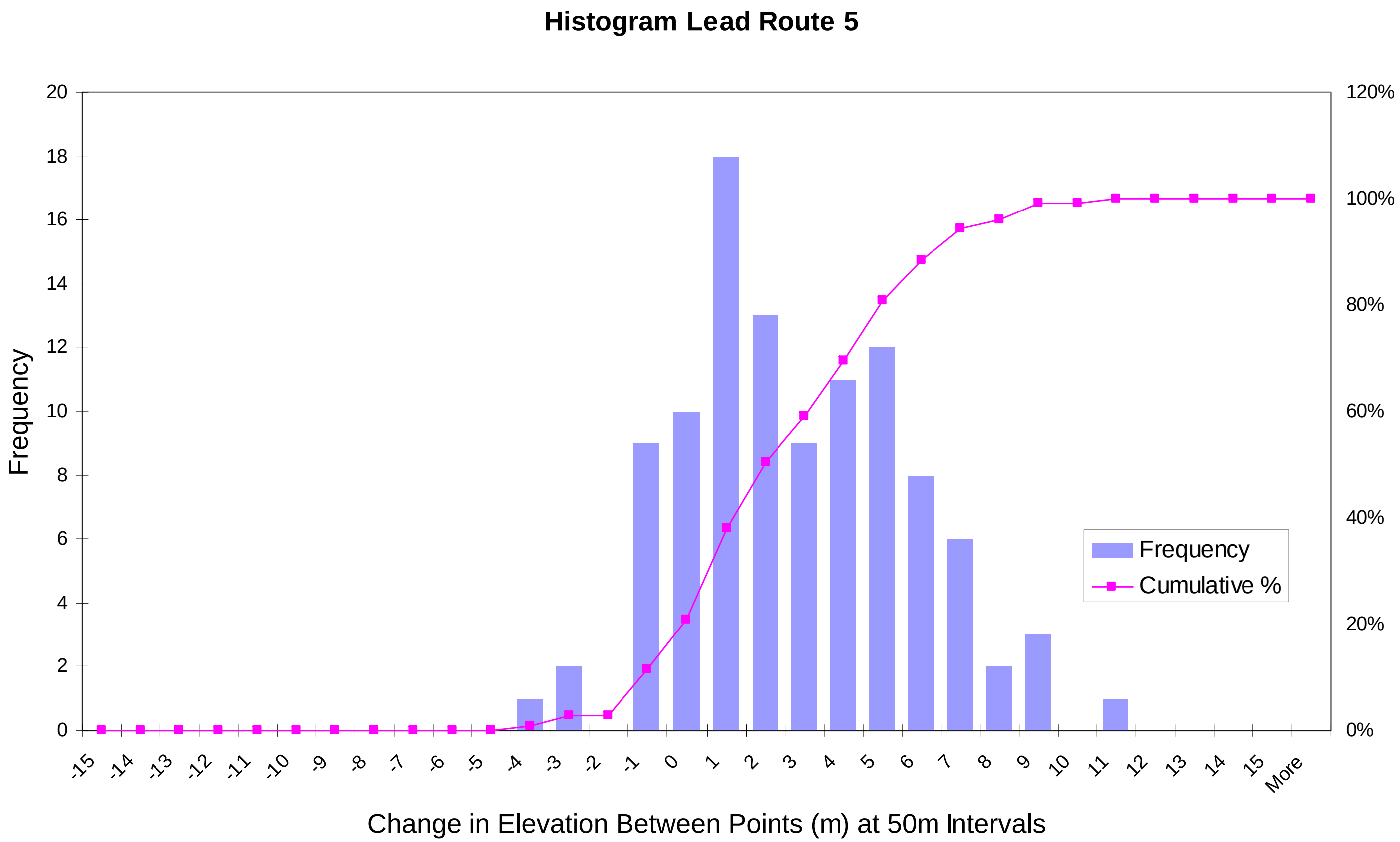


Figure 103: Lead Route 5: Histogram

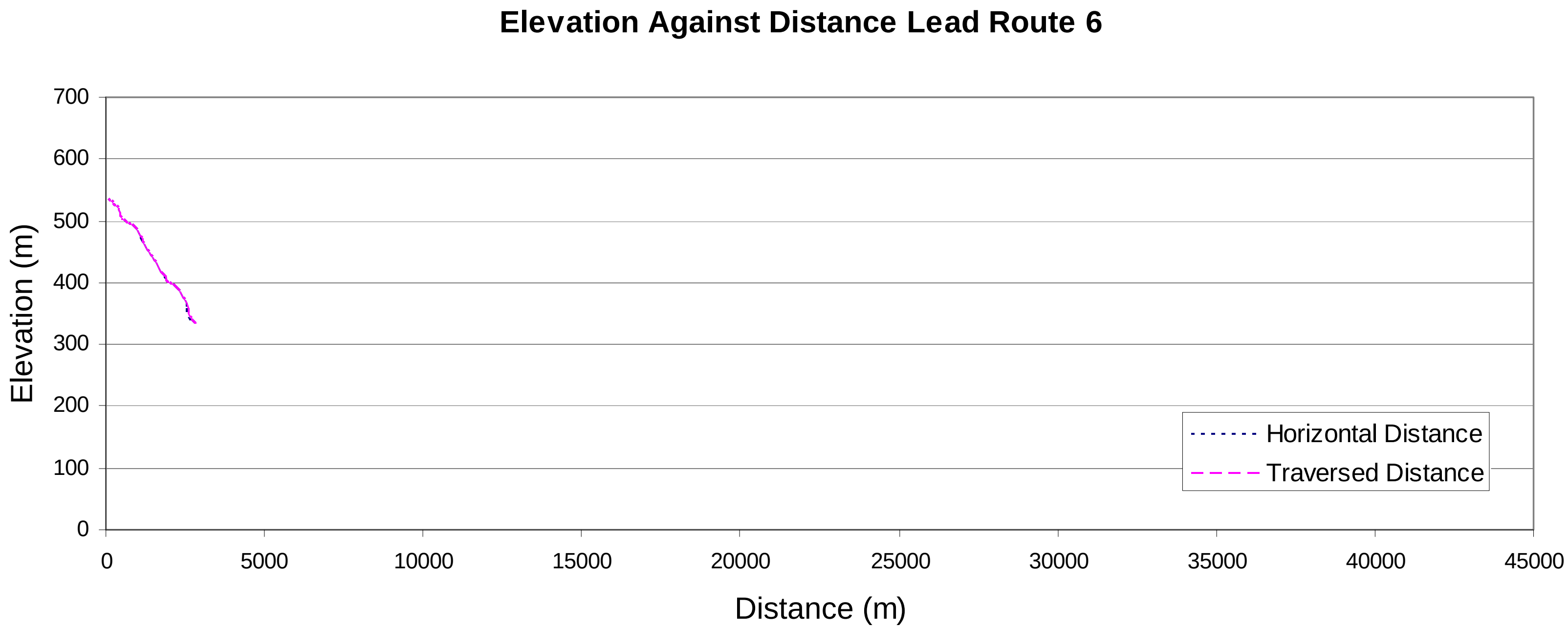


Figure 104: Lead Route 6: Elevation against Distance

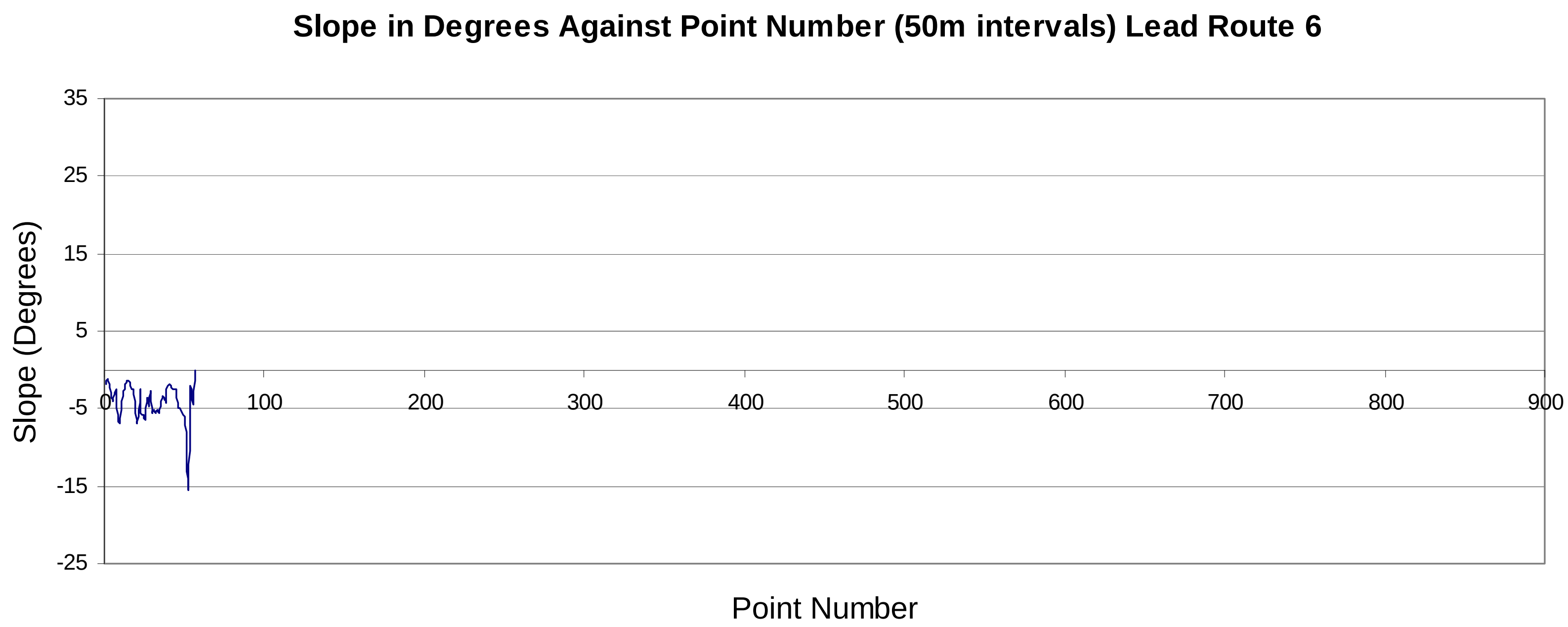


Figure 105: Lead Route 6: Slope in Degrees against Point Number

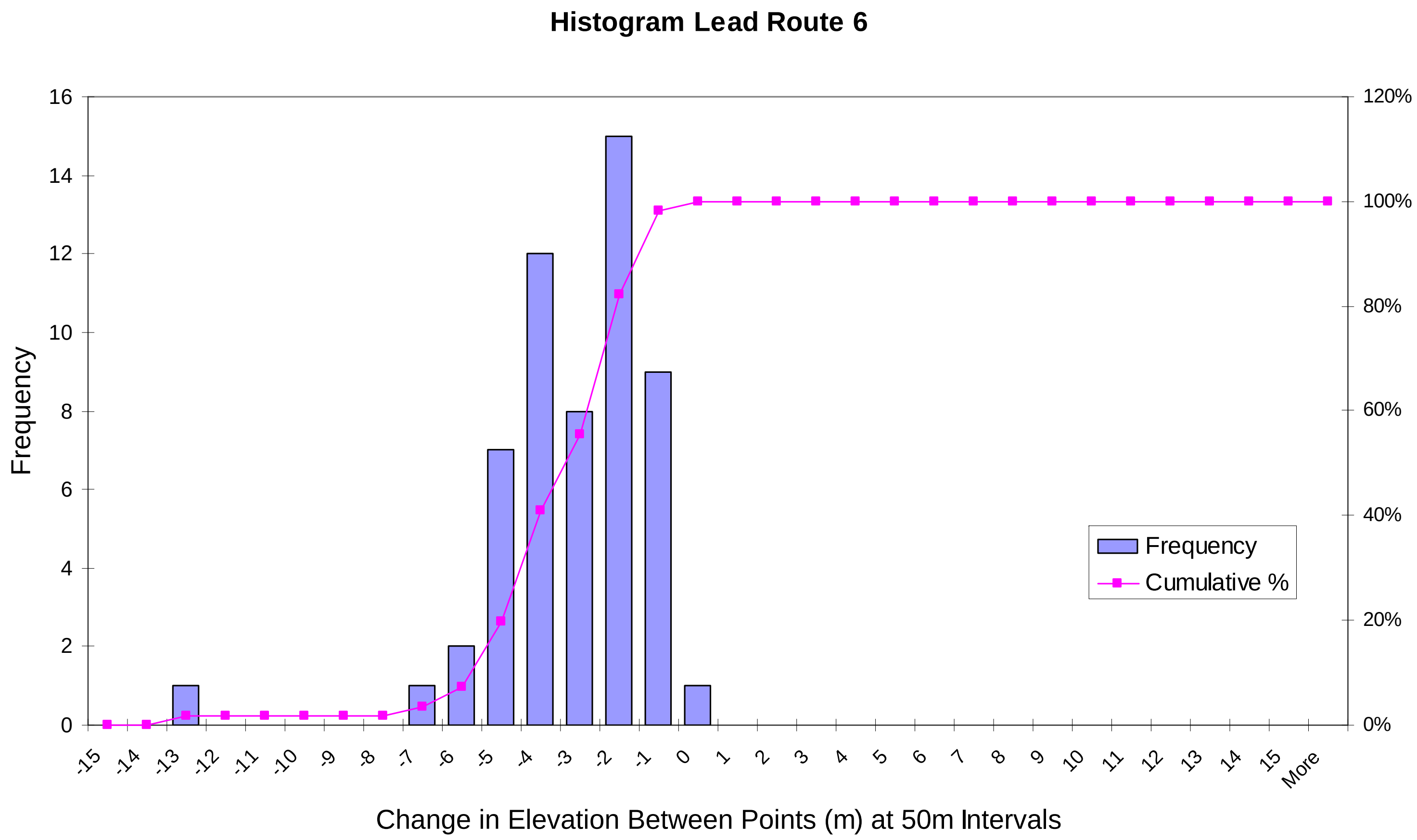


Figure 106: Lead Route 6: Histogram

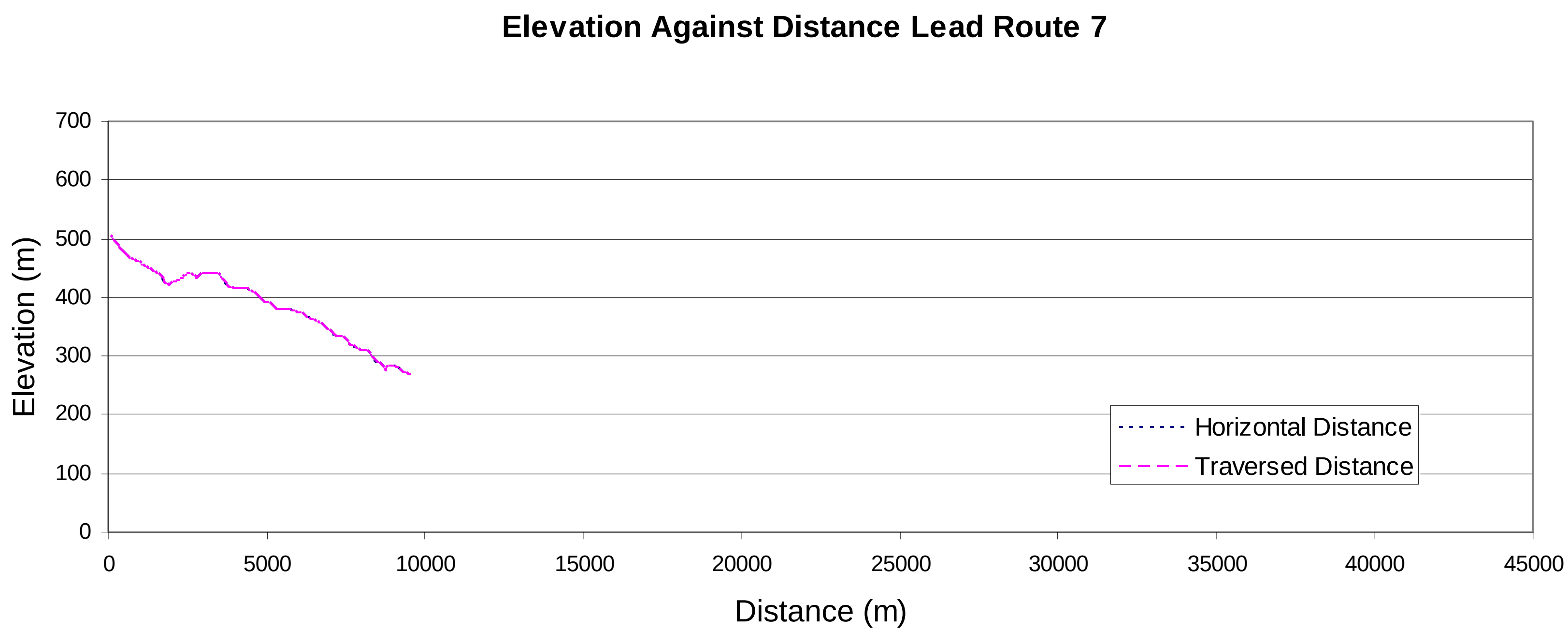


Figure 107: Lead Route 7: Elevation against Distance

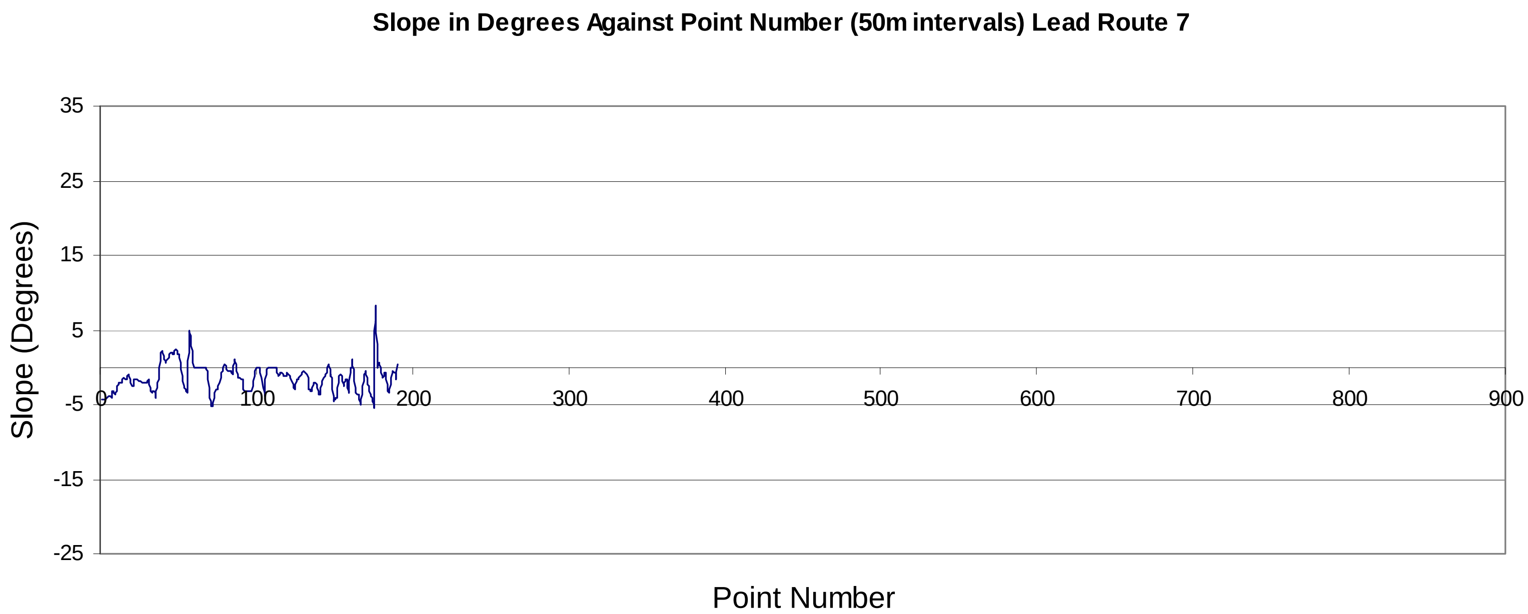


Figure 108: Lead Route 7: Slope in Degrees against Point Number

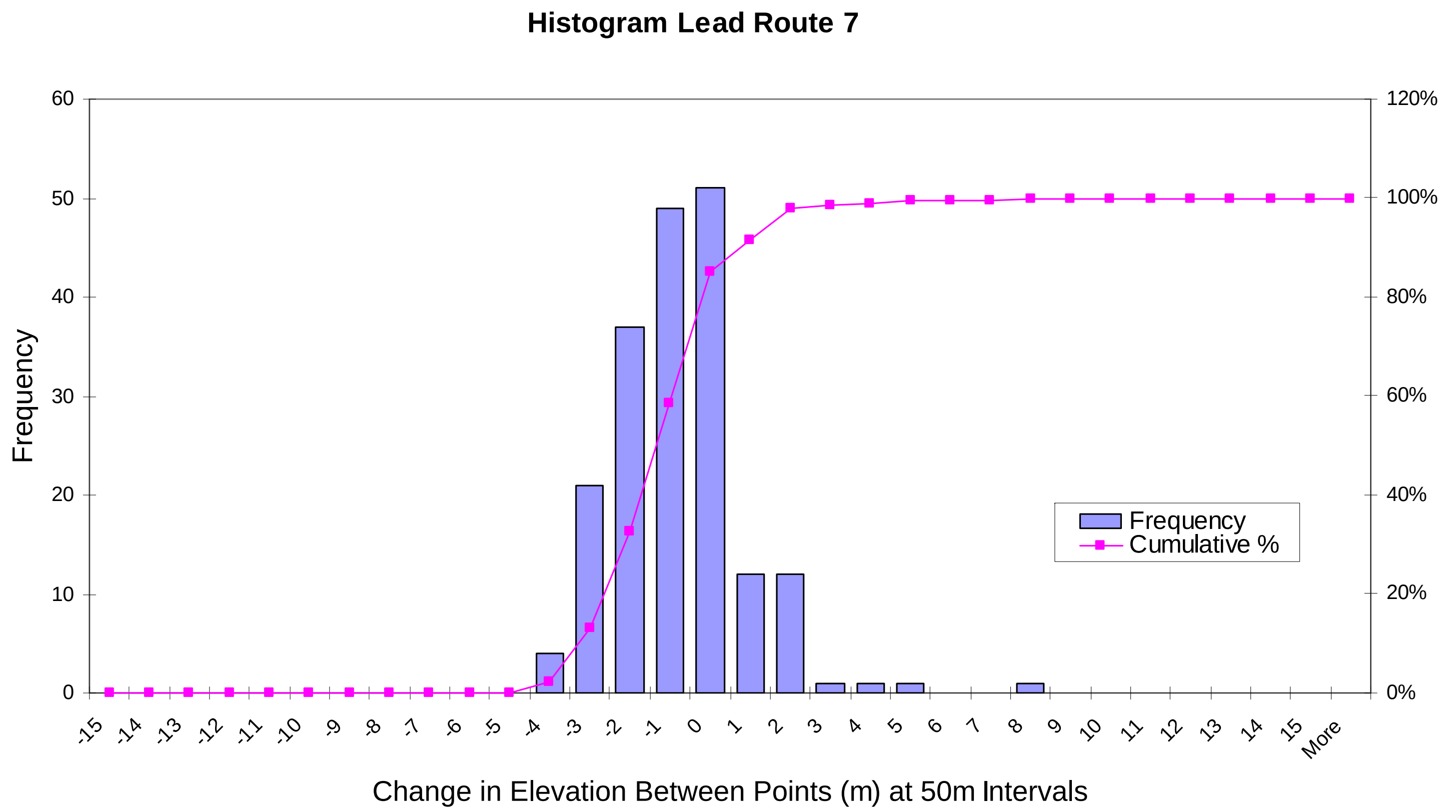


Figure 109: Lead Route 7: Histogram

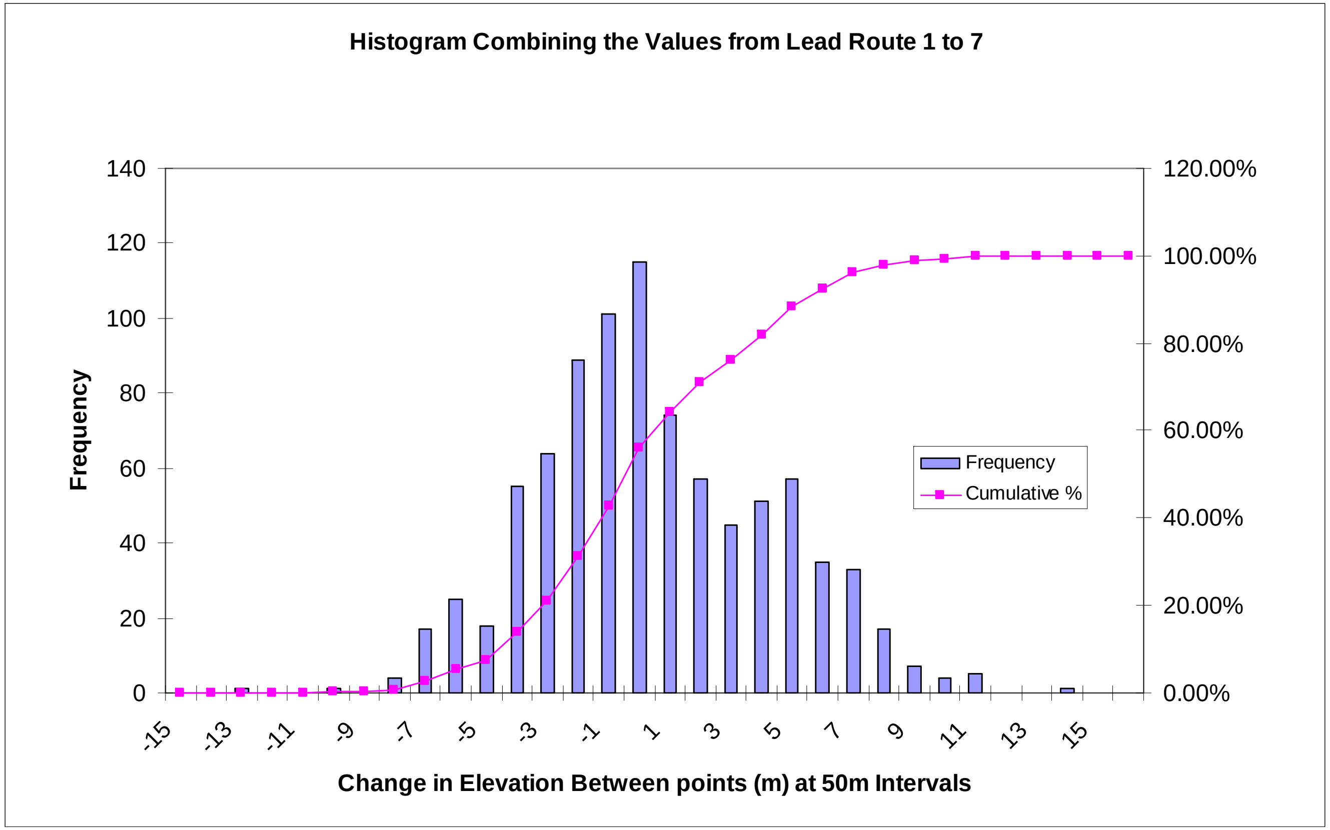


Figure 110: Combined Histogram

12.5.2 Least Cost Routes of the Lead Routes

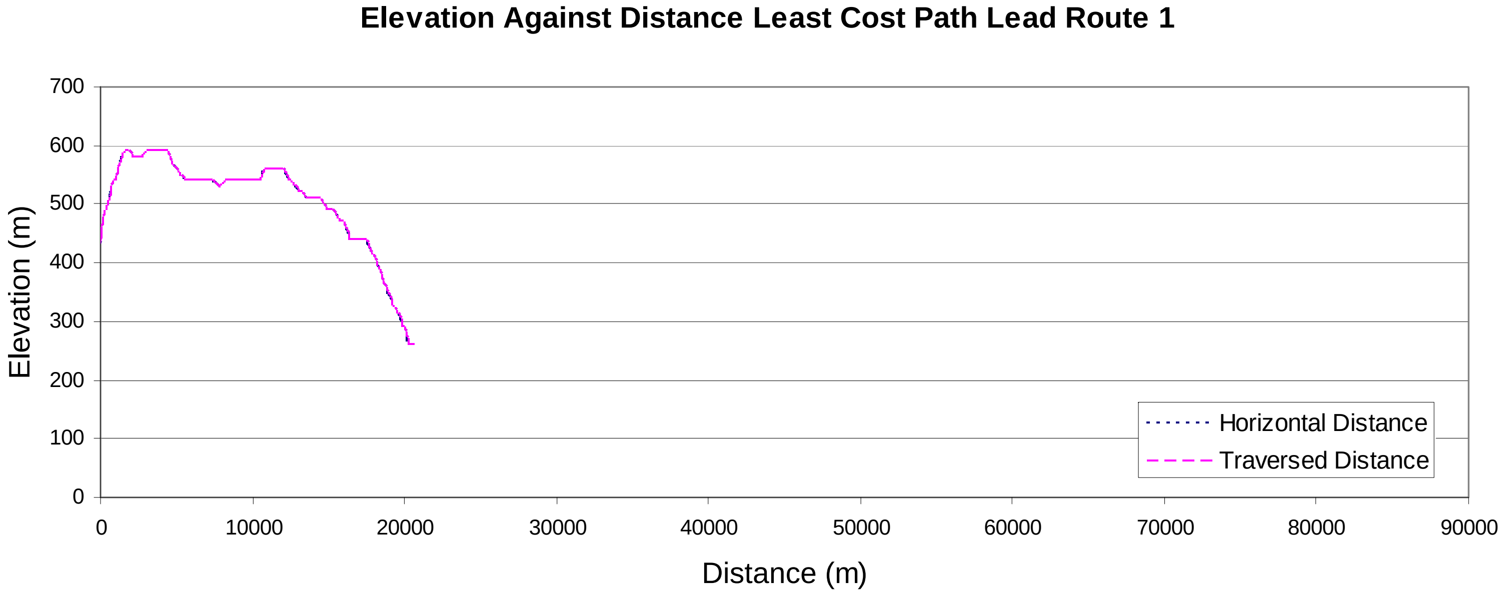


Figure 111: Lead Route 1: Elevation against Distance Least Cost

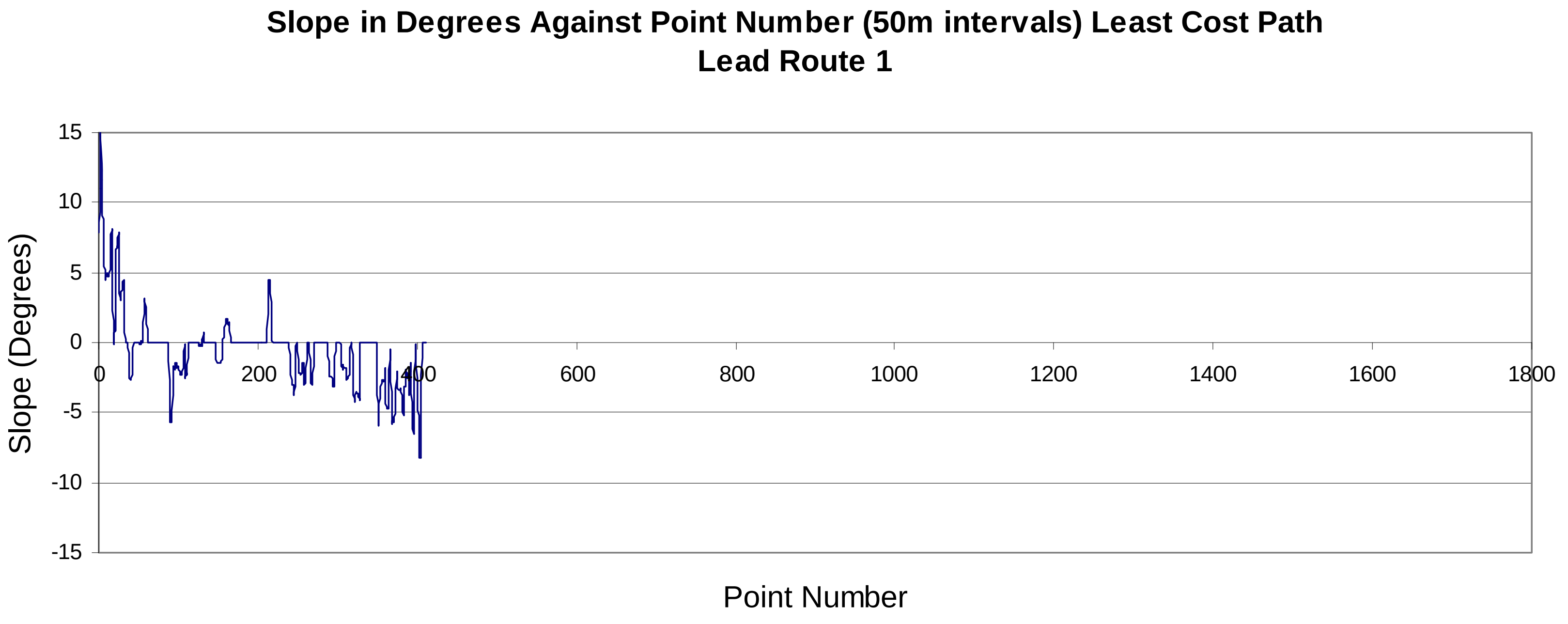


Figure 112: Lead Route 1: Slope in Degrees against Point Number

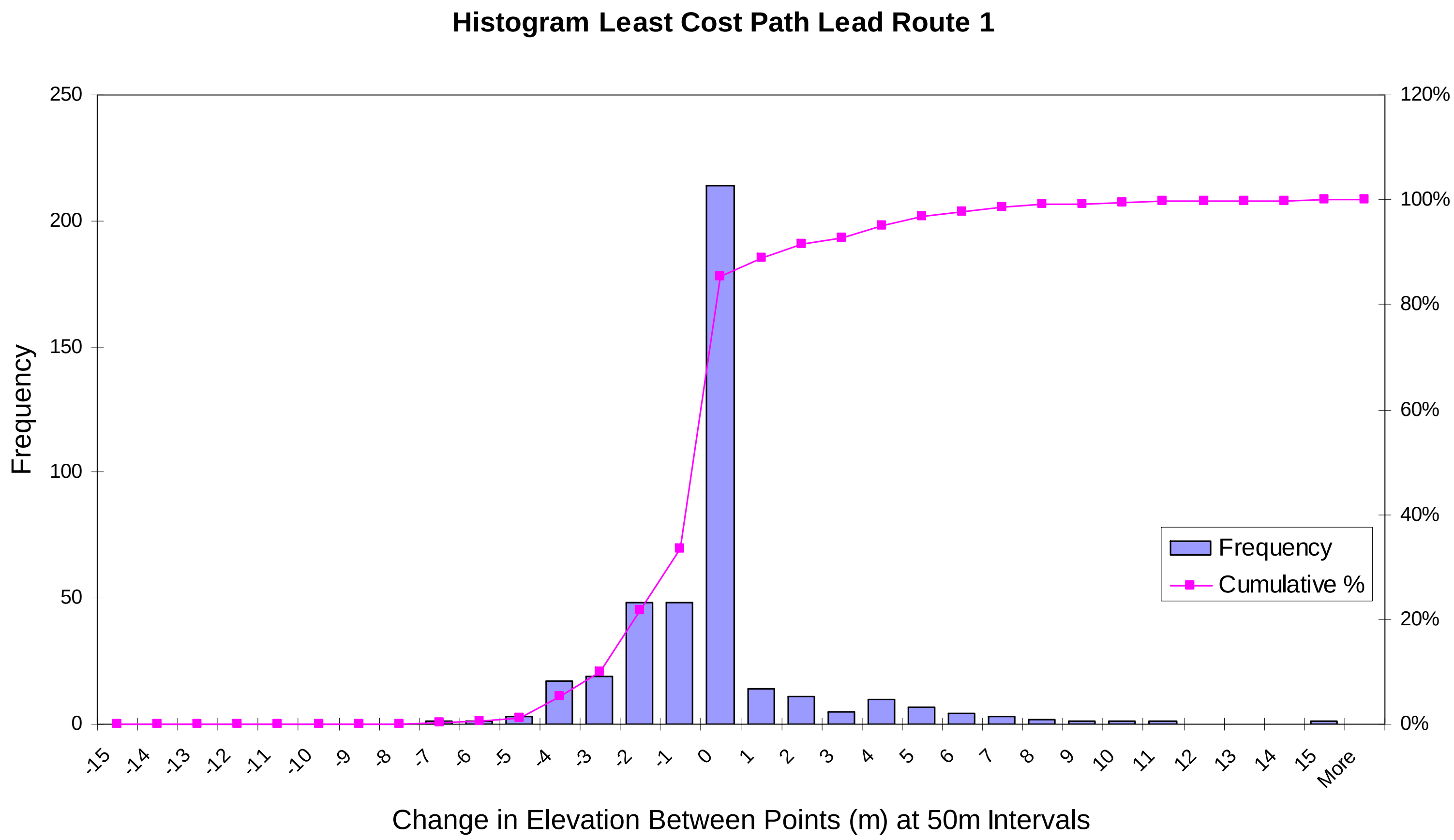


Figure 113: Lead Route 1: Histogram Least Cost

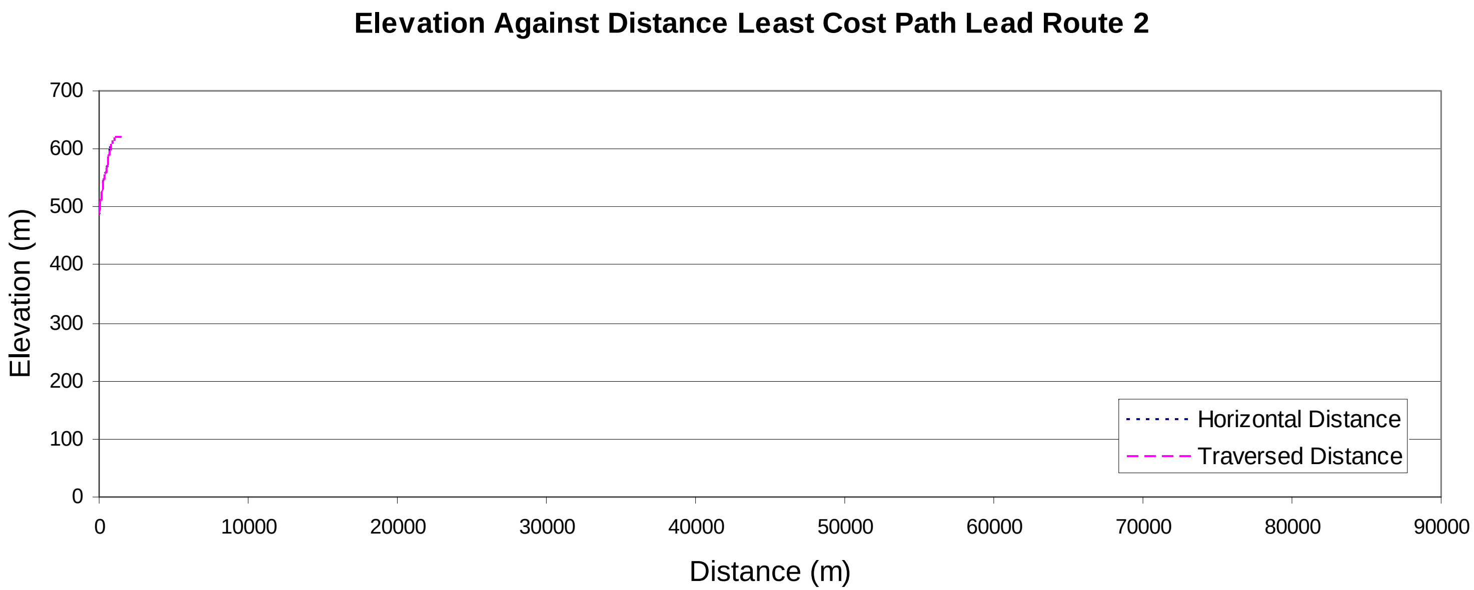


Figure 114: Lead Route 2: Elevation against Distance Least Cost

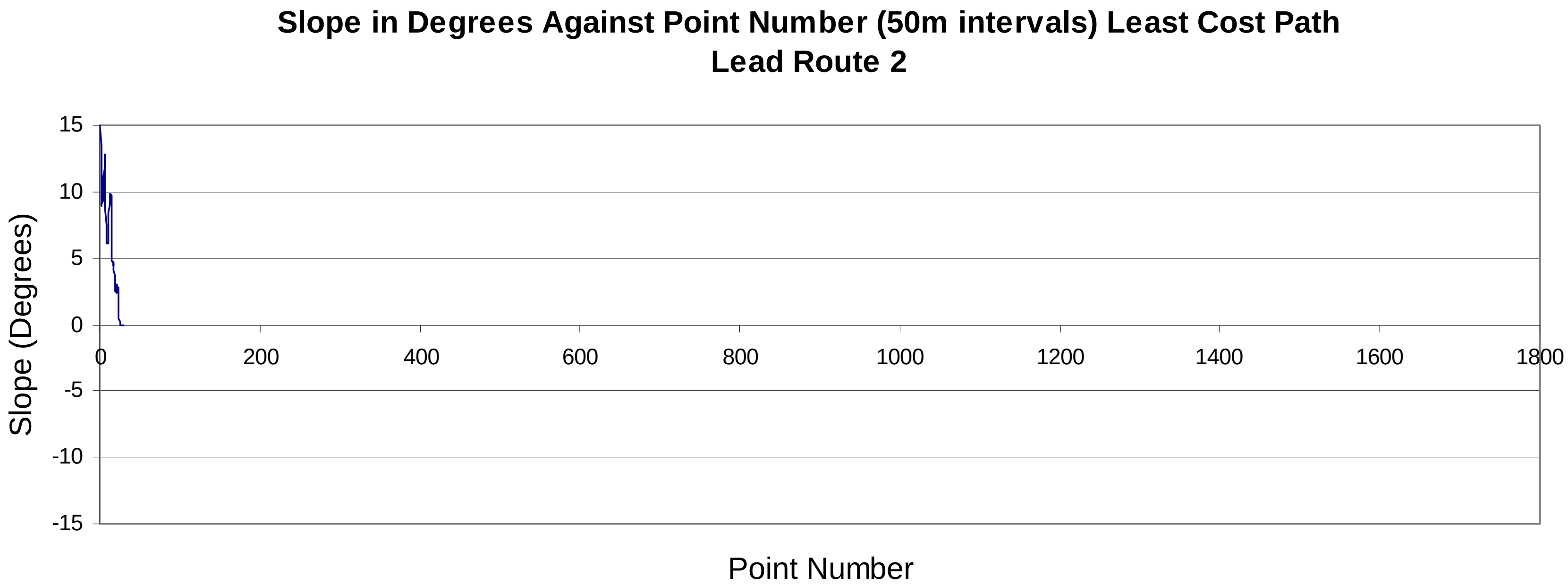


Figure 115: Lead Route 2: Slope in Degrees against Point Number Least Cost

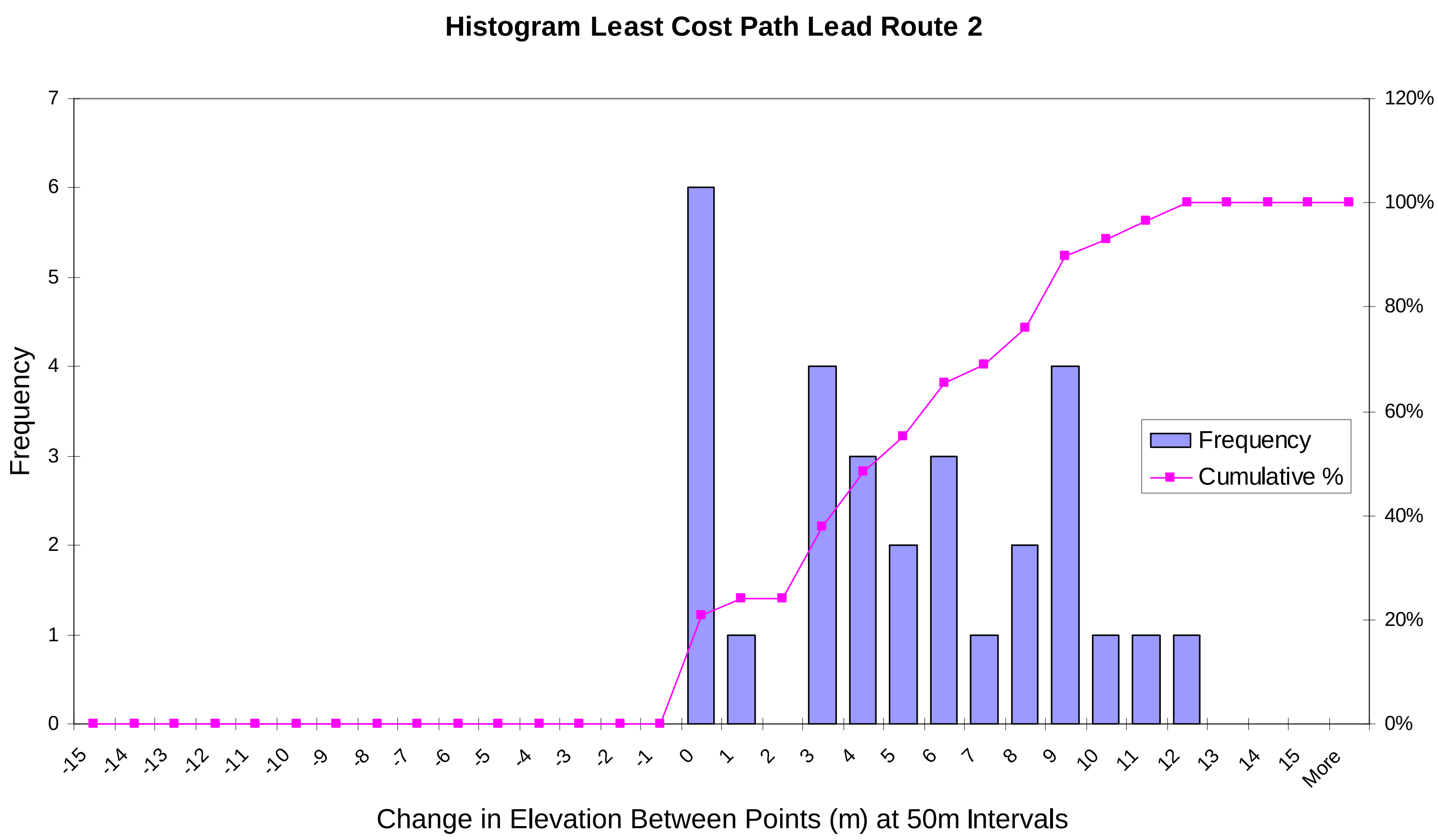


Figure 116: Lead Route 2: Histogram Least Cost

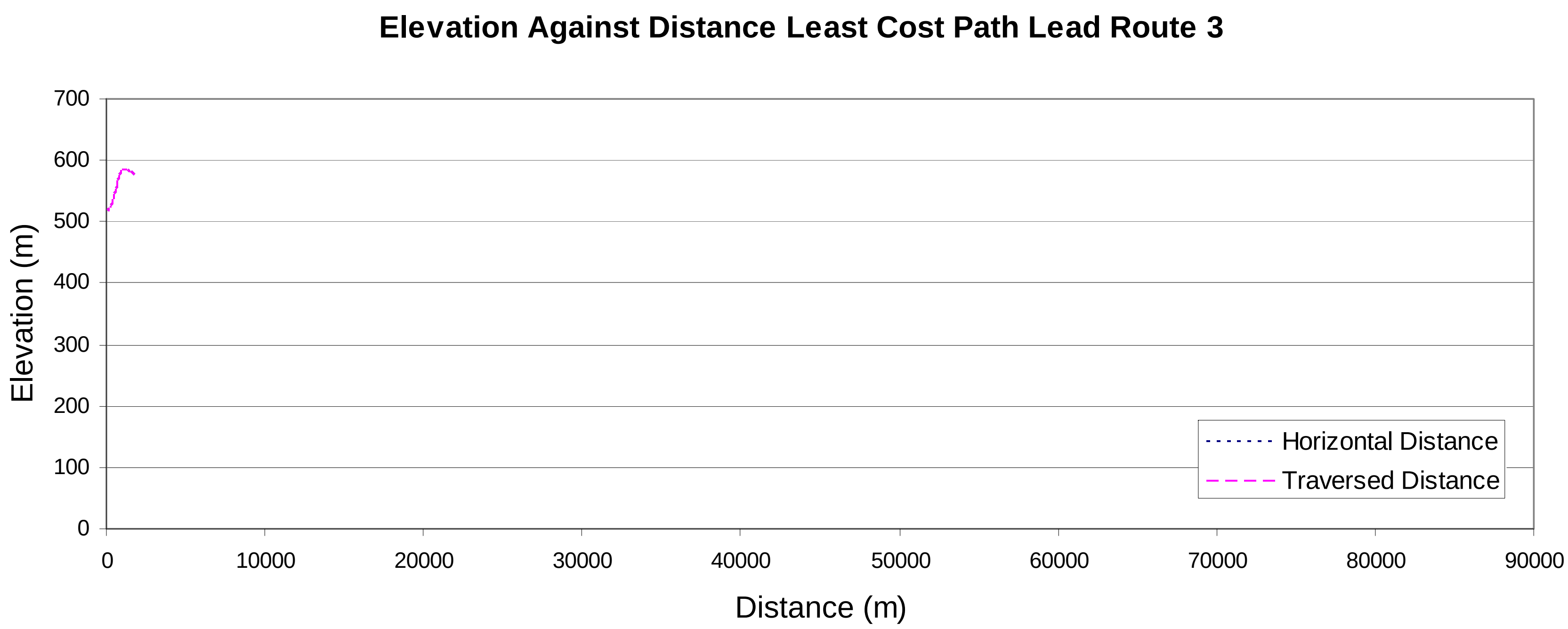


Figure 117: Lead Route 3: Elevation against Distance Least Cost

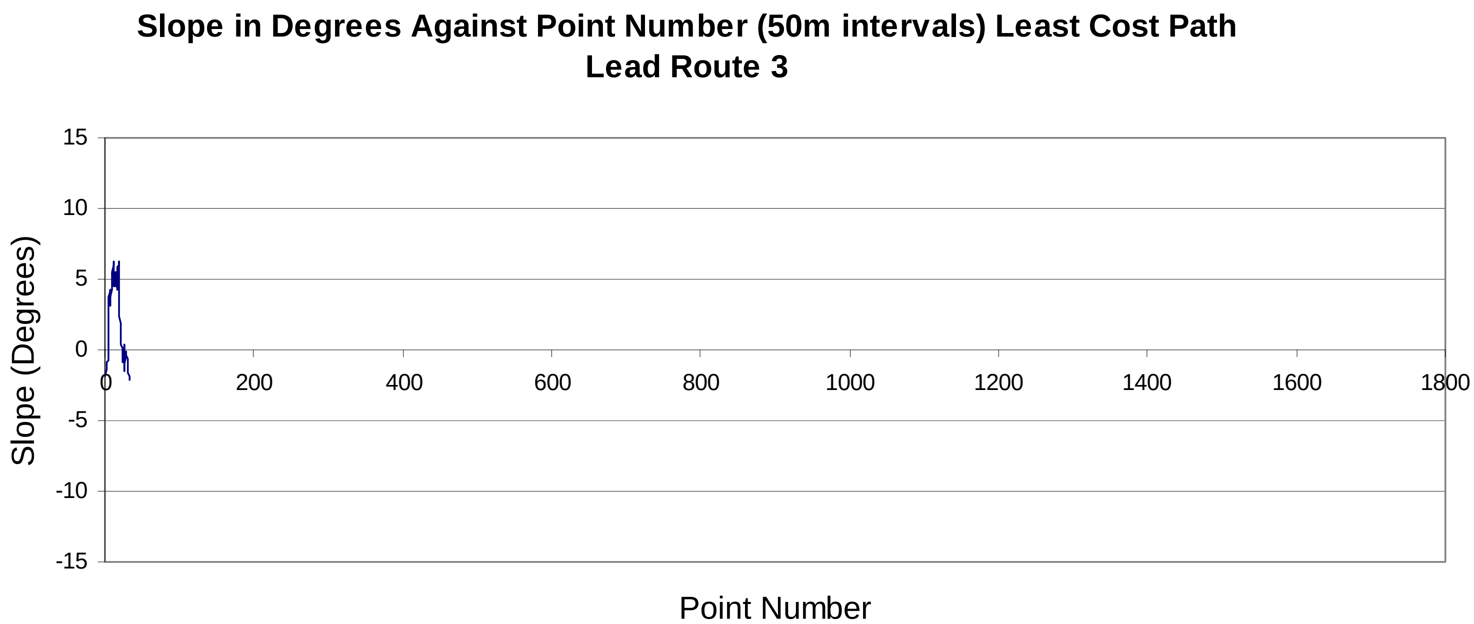


Figure 118: Lead Route 3: Slope in Degrees against Point Number Least Cost

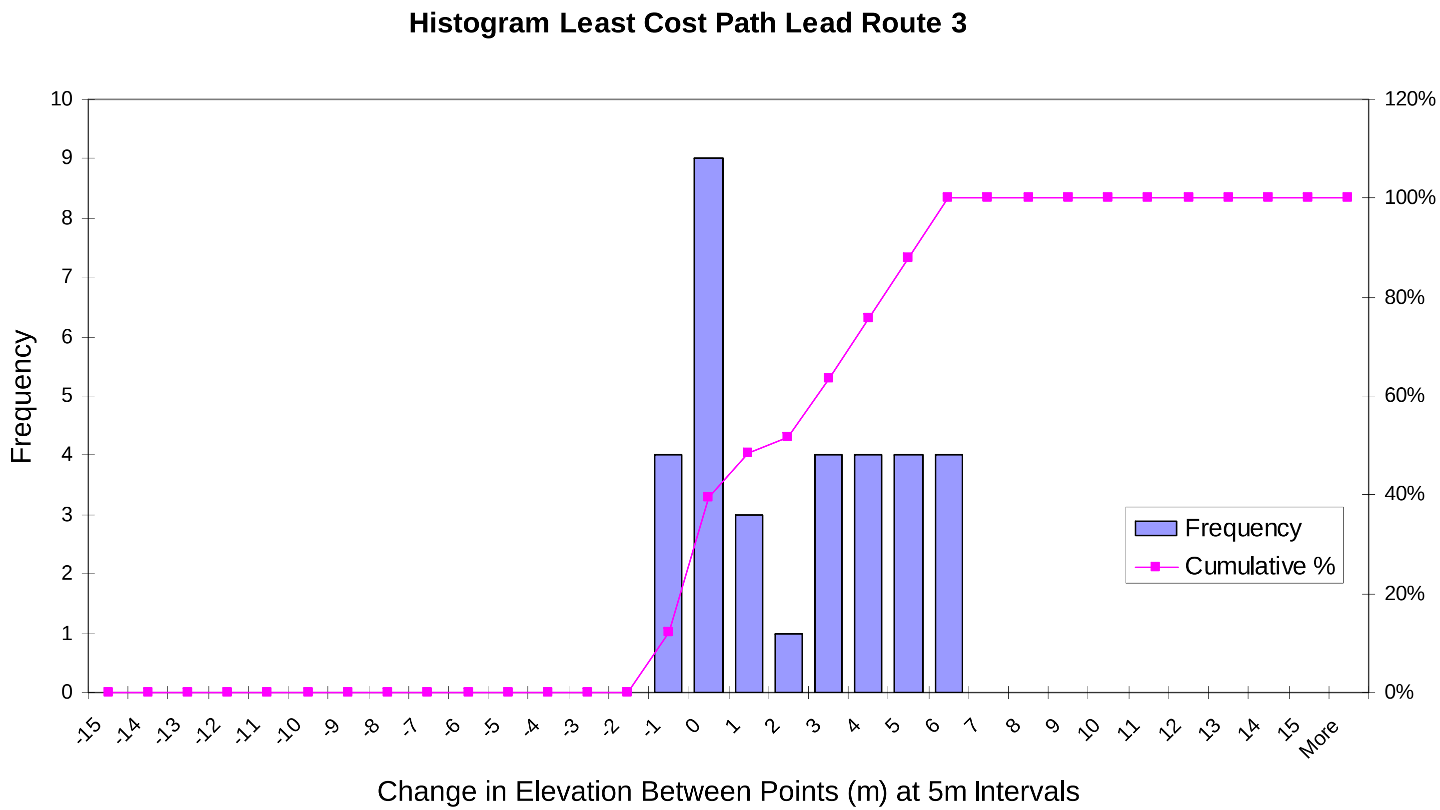


Figure 119: Lead Route 3: Histogram Least Cost

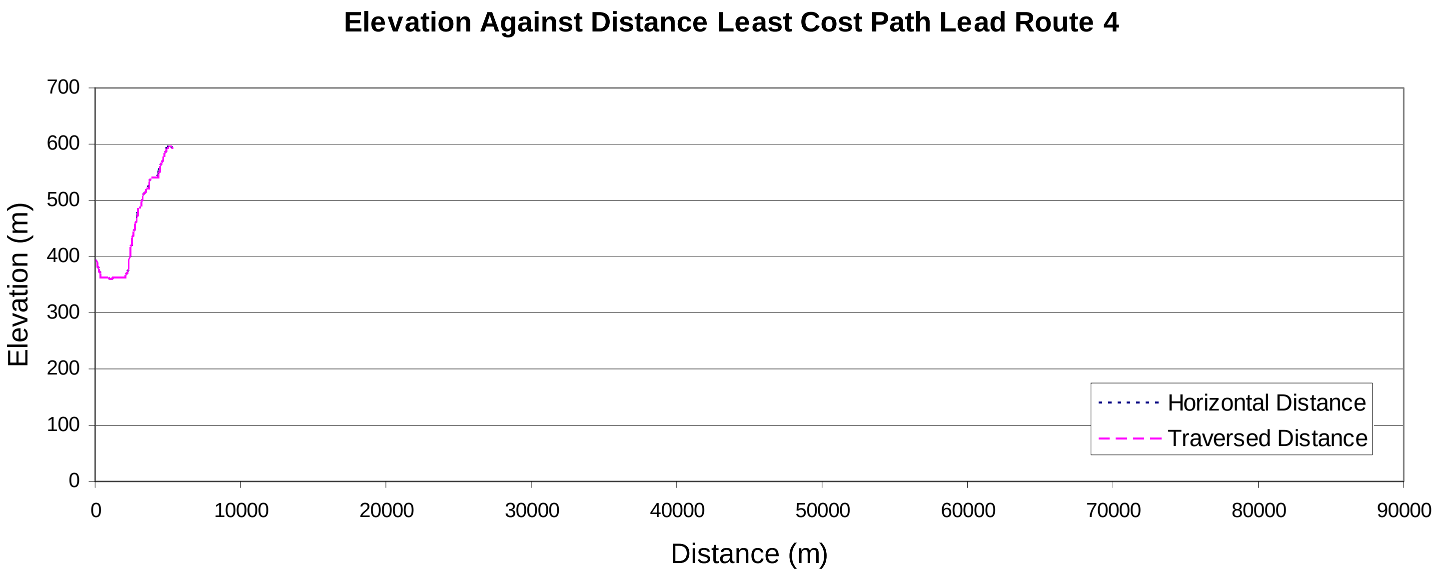


Figure 120: Lead Route 4: Elevation against Distance Least Cost

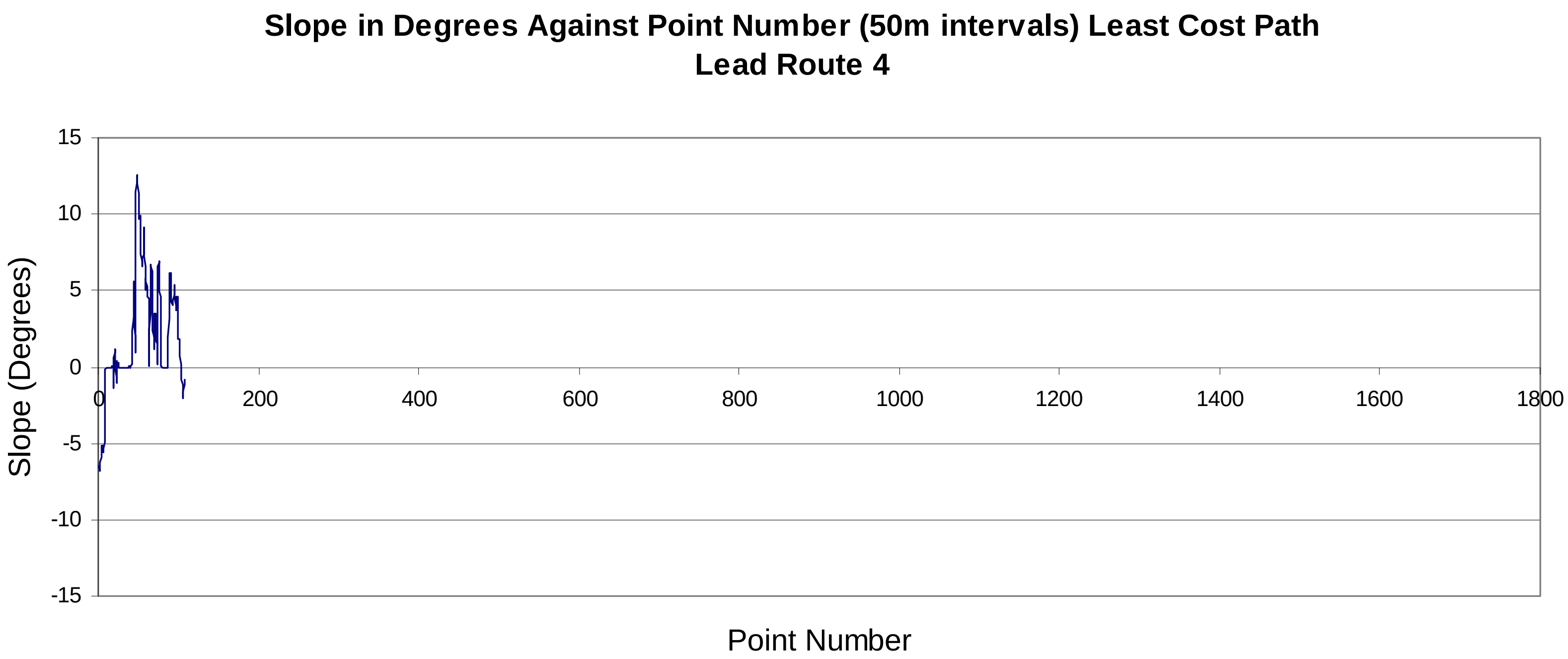


Figure 121: Lead Route 4: Slope in Degrees against Point Number Least Cost

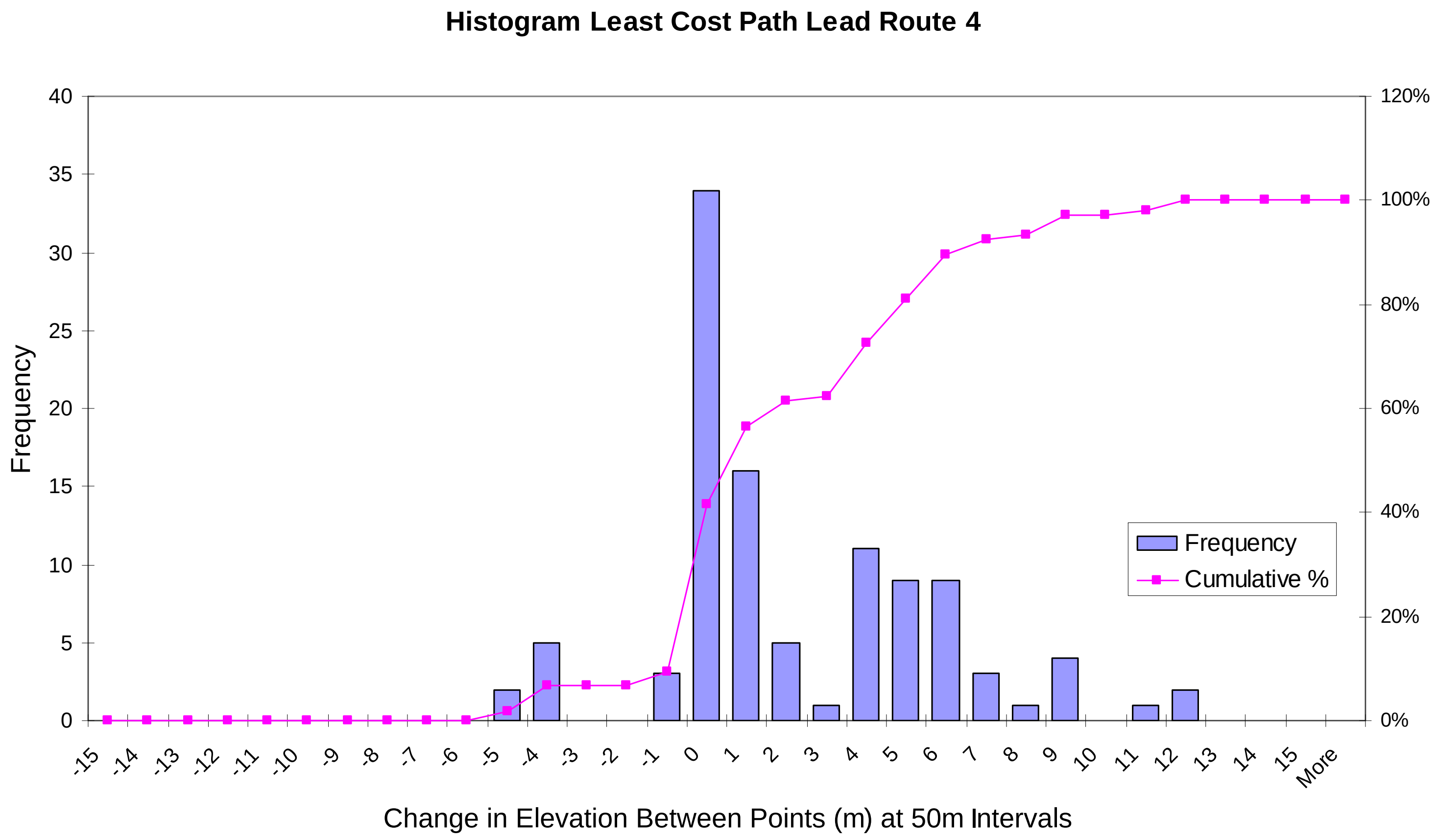


Figure 122: Lead Route 4: Histogram Least Cost

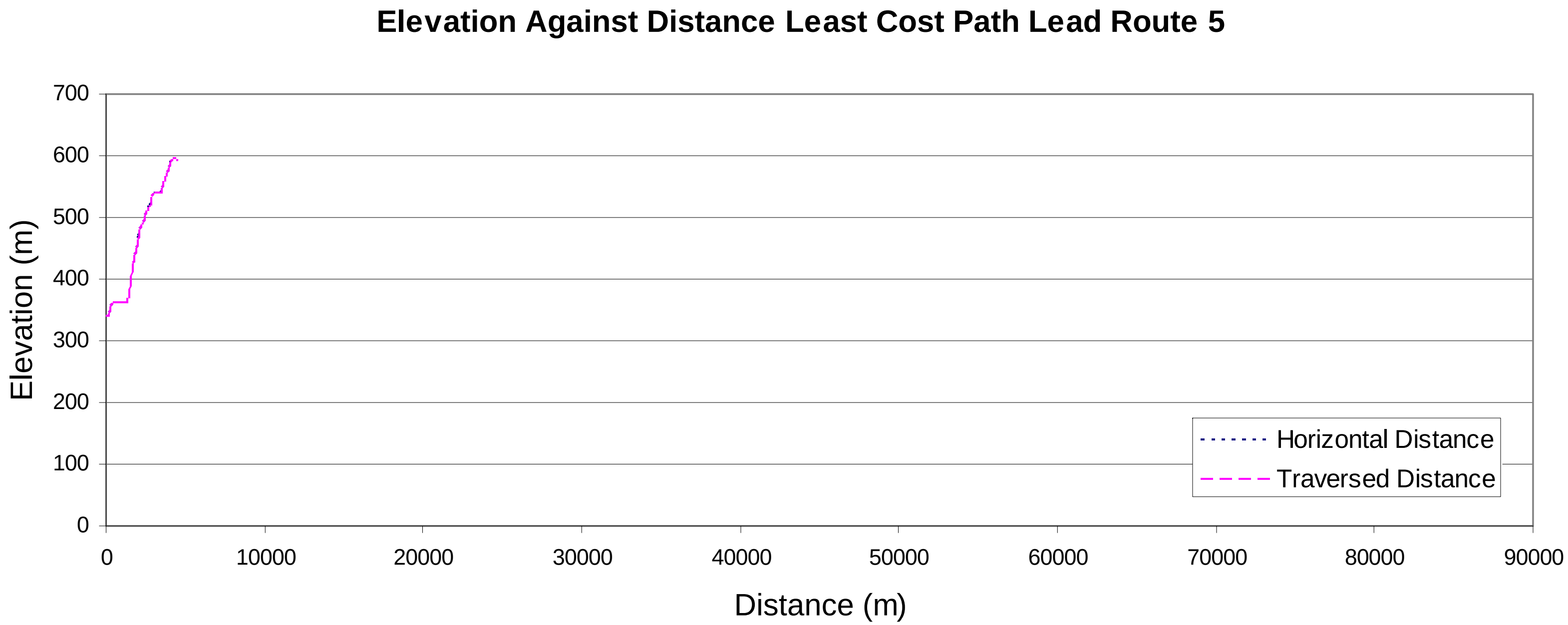


Figure 123: Lead Route 5: Elevation against Distance Least Cost

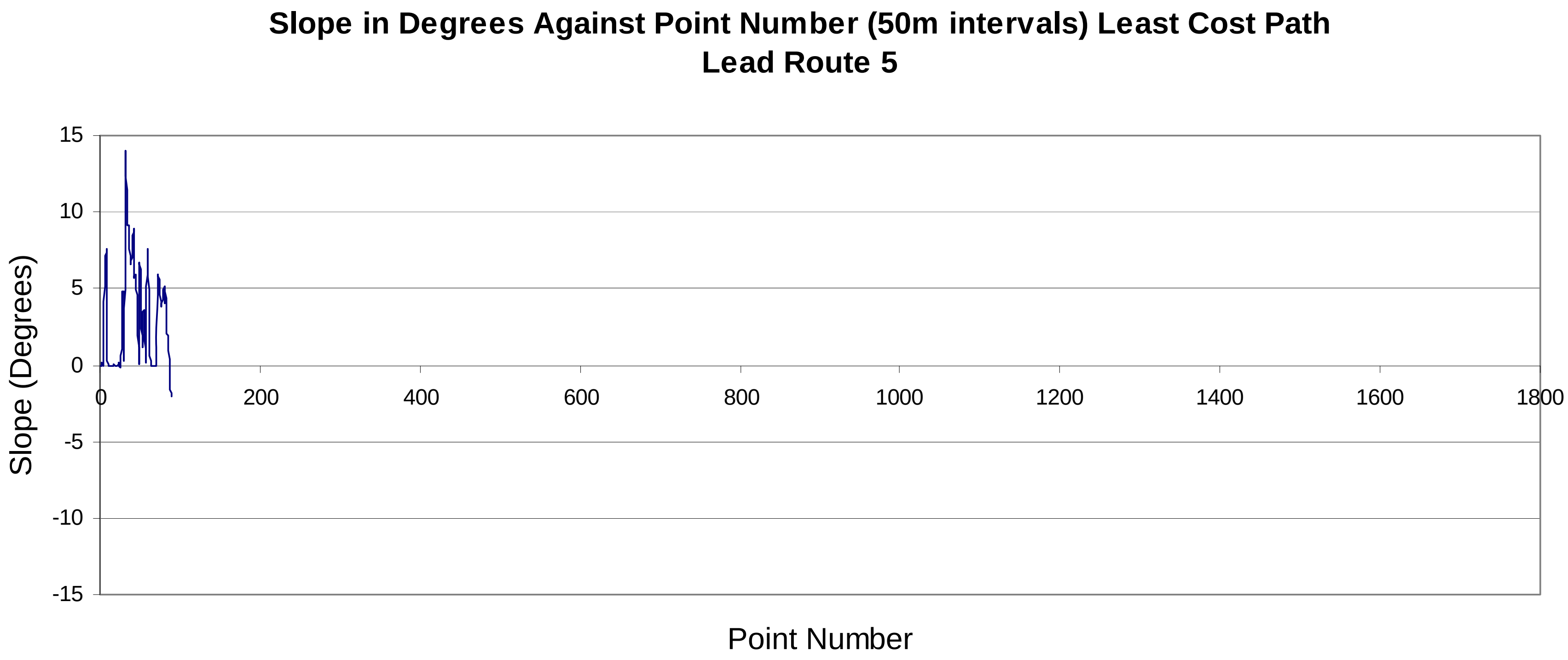


Figure 124: Lead Route 5: Slope in Degrees against Point Number Least Cost

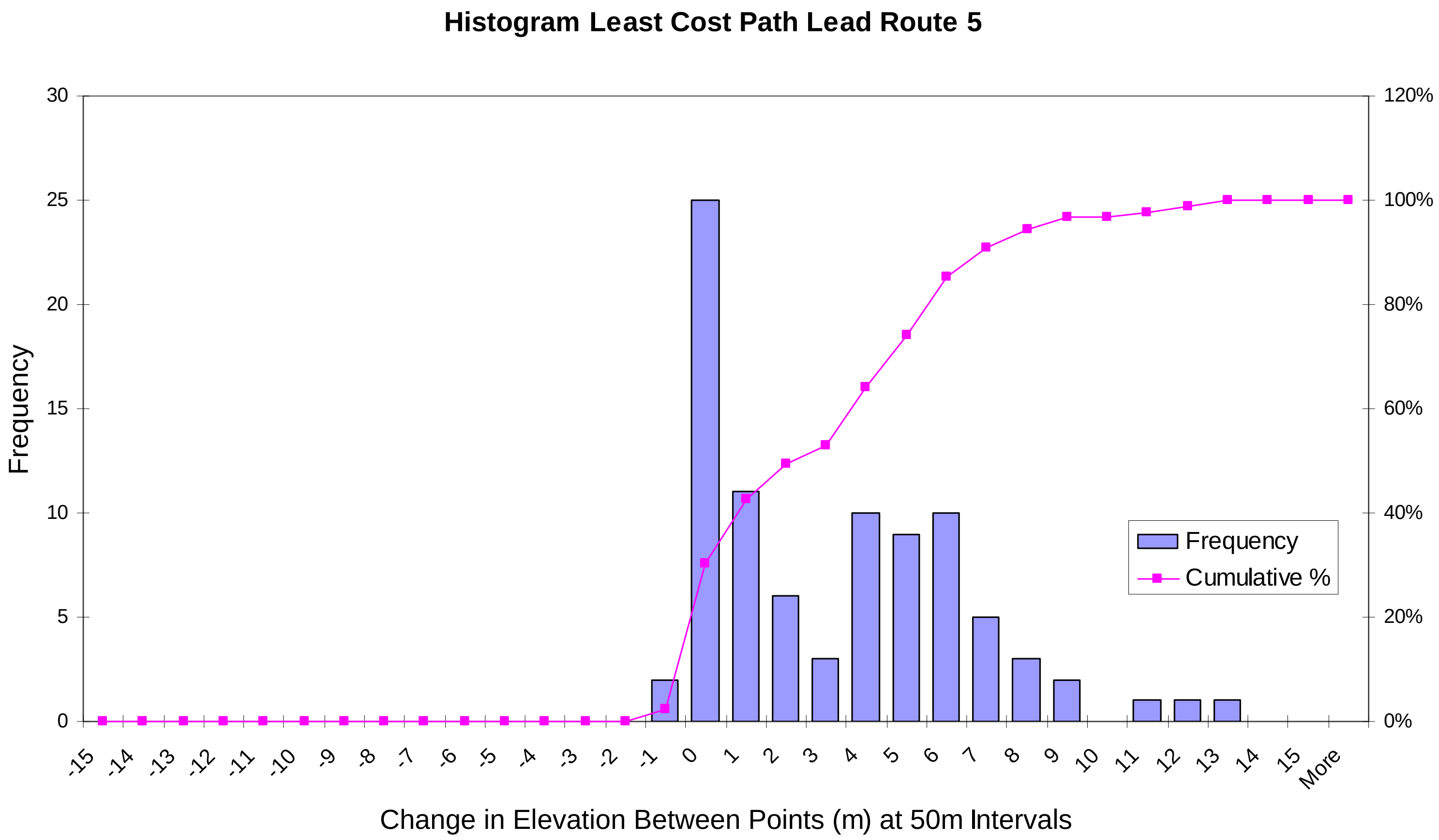


Figure 125: Lead Route 5: Histogram Least Cost

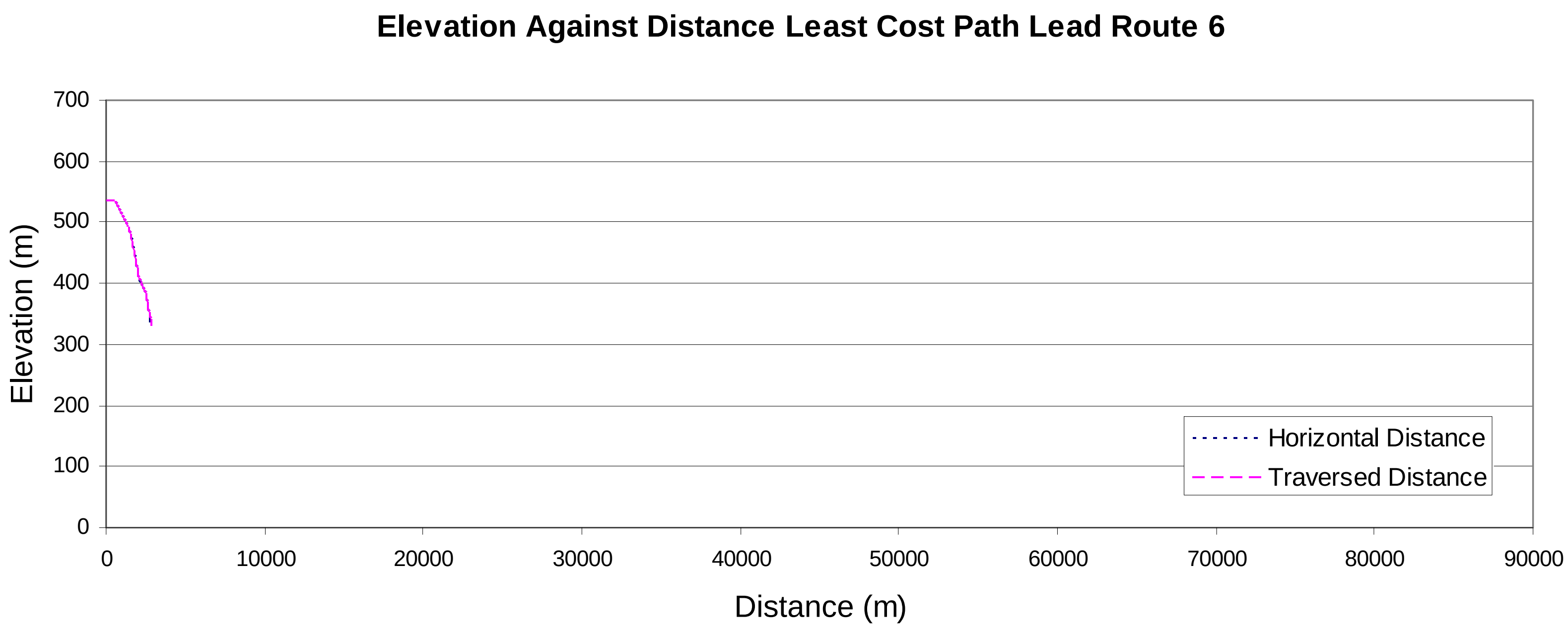


Figure 126: Lead Route 6: Elevation against Distance Least Cost

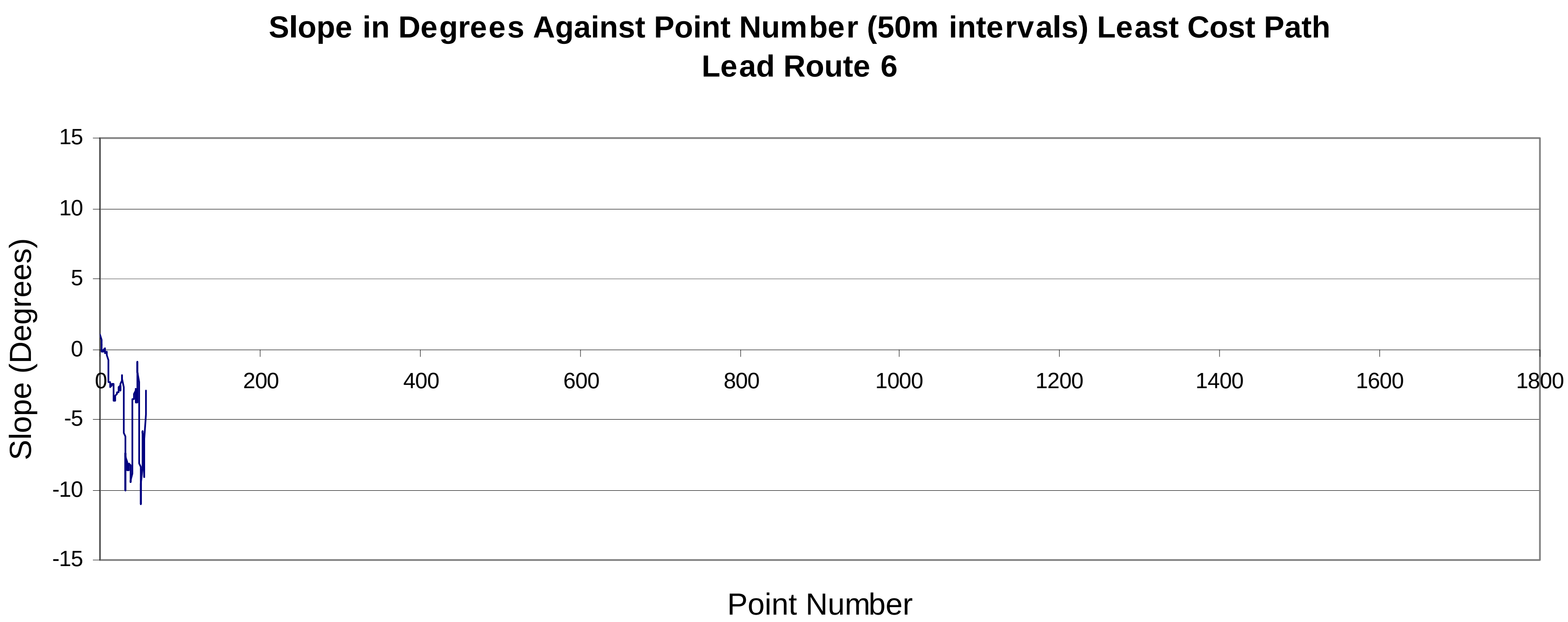


Figure 127: Lead Route 6: Slope in Degrees against Point Number Least Cost

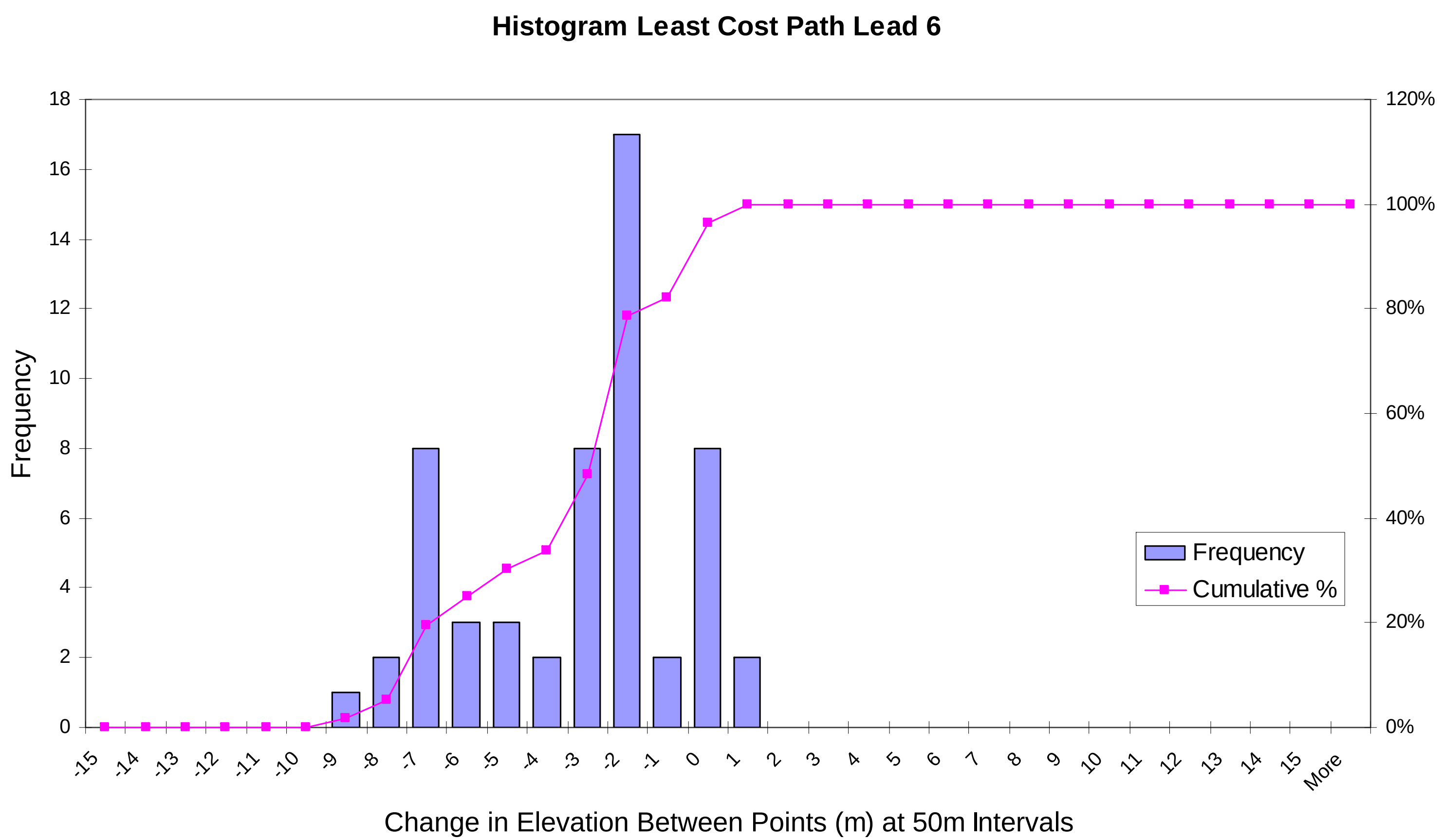


Figure 128: Lead Route 6: Histogram Least Cost

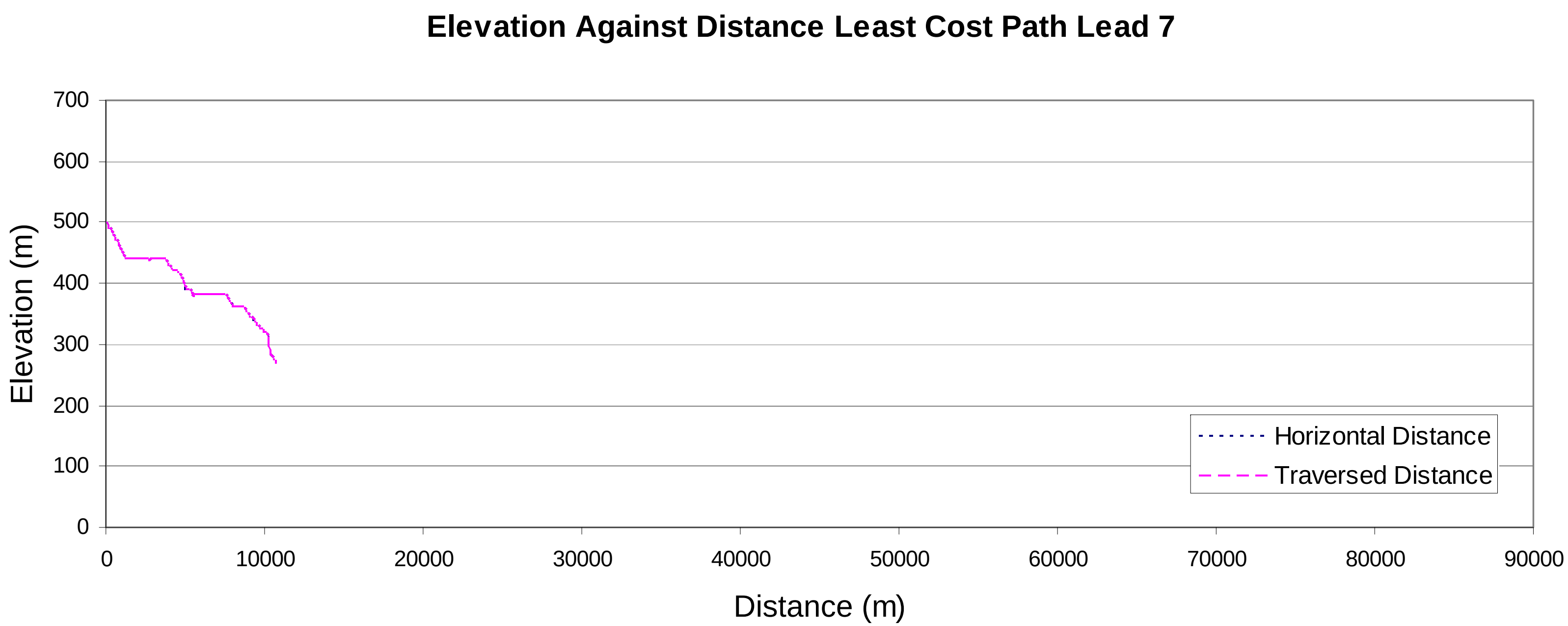


Figure 129: Lead Route 7: Elevation against Distance Least Cost

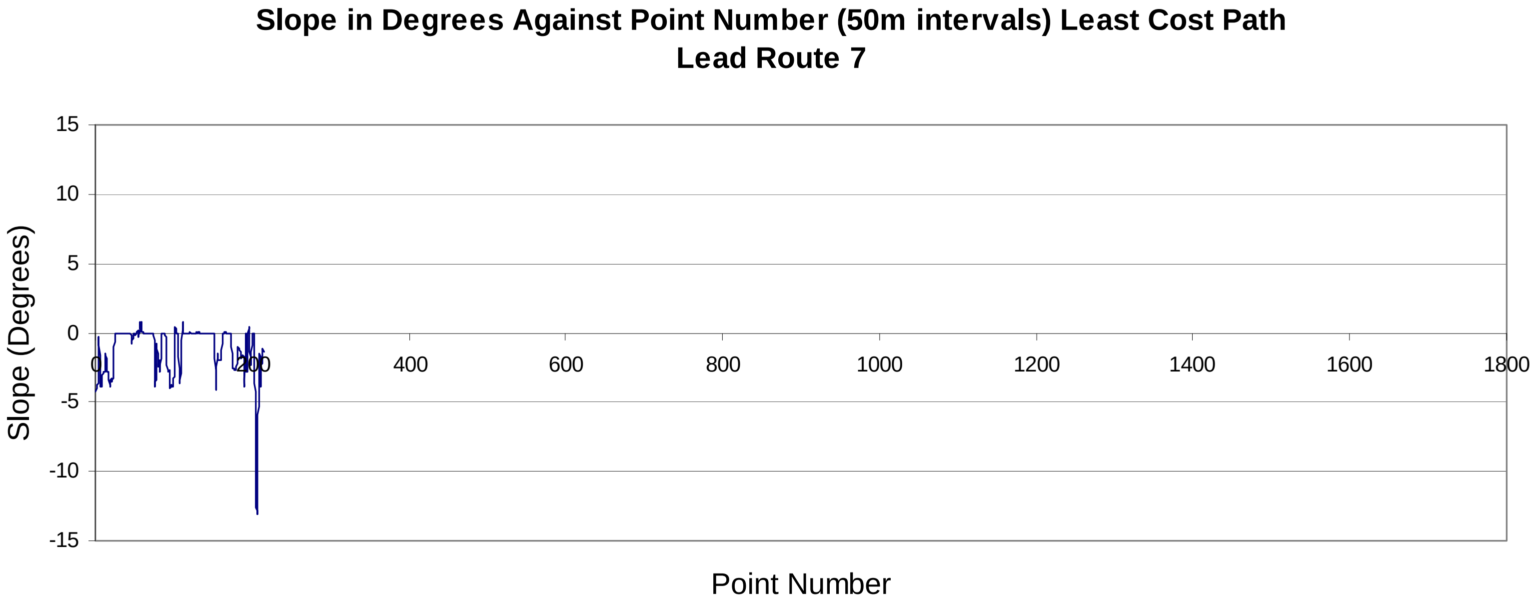


Figure 130: Lead Route 7: Slope in Degrees against Point Number Least Cost

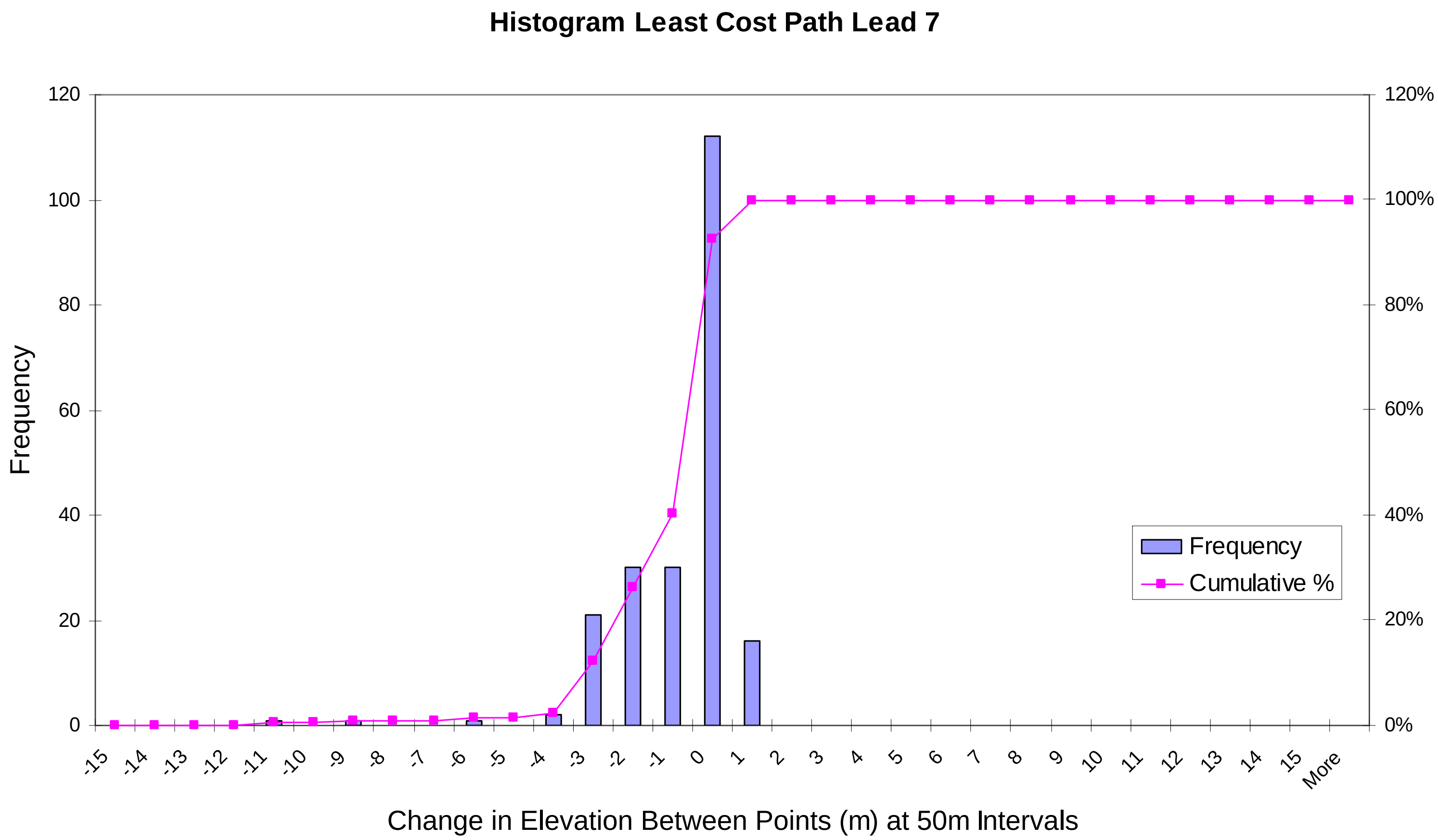


Figure 131: Lead Route 7: Histogram Least Cost Lead

12.5.3 Land Use Types Crossed

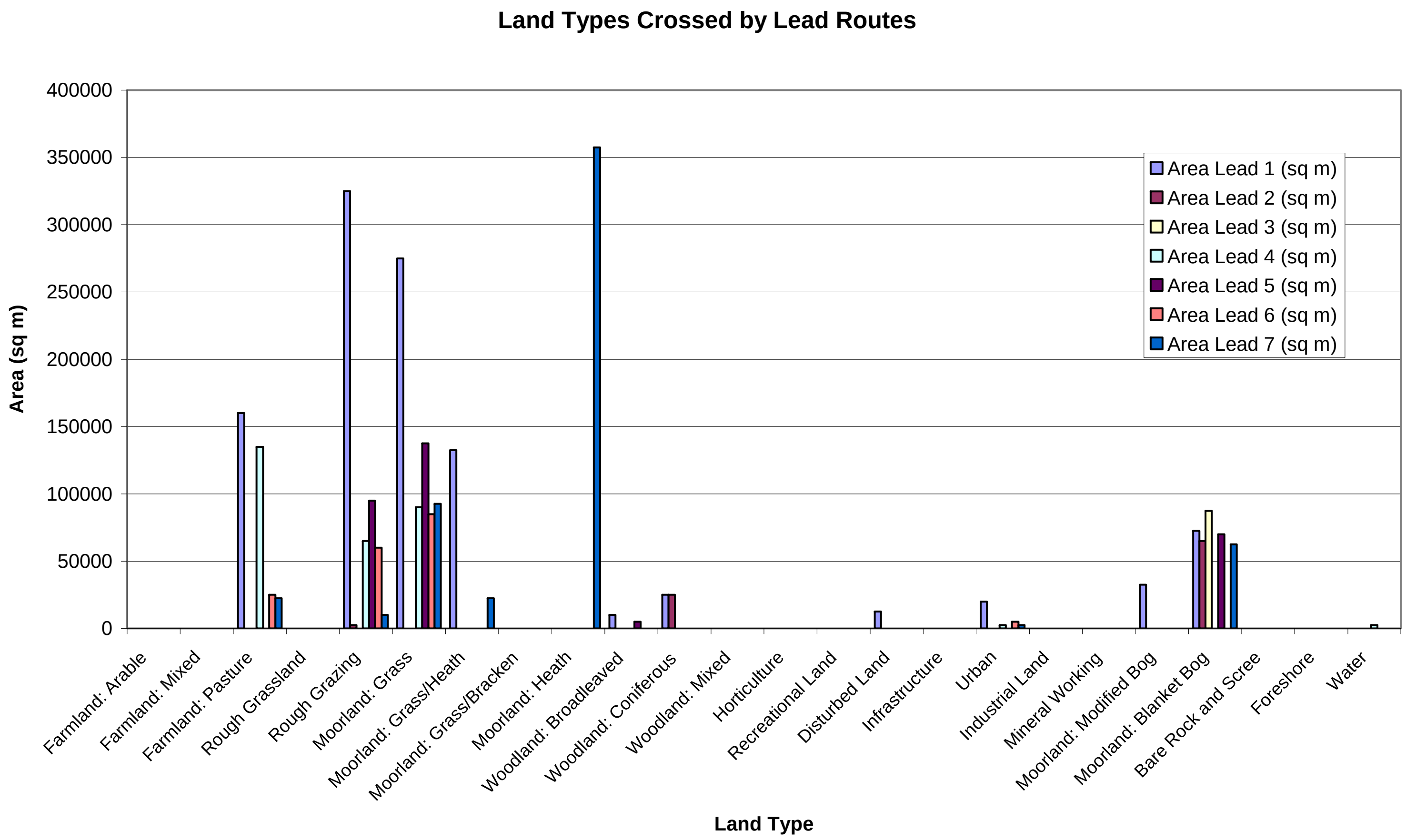


Figure 132: Land Use Types Crossed by Lead Routes

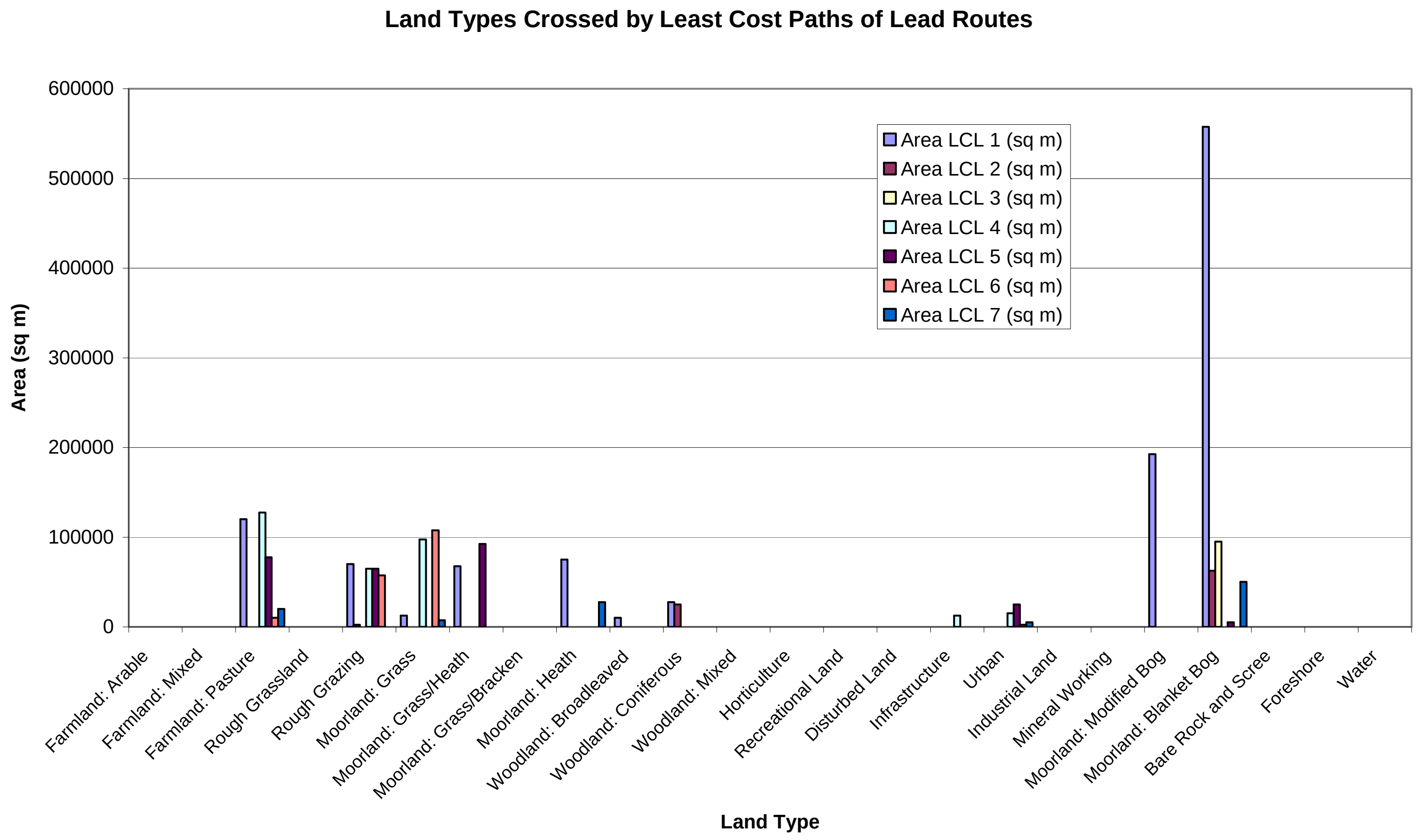


Figure 133: Land Use types Crossed by Least Cost Lead Routes

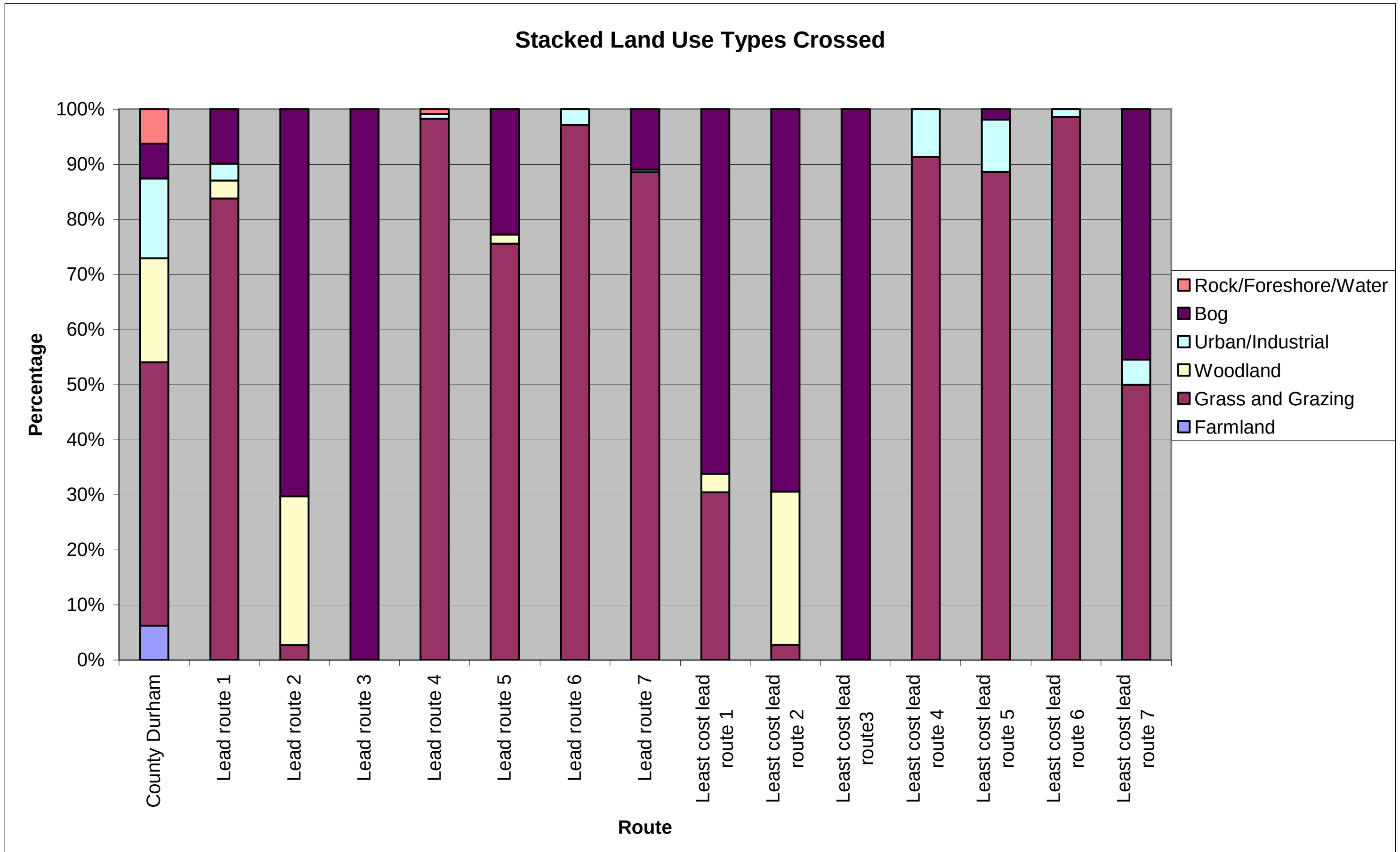


Figure 134: Stacked Land Use Types Crossed for the Lead Routes and their Least Cost Routes.

Figure 135: The Use of Liminal Land by Lead Route 7

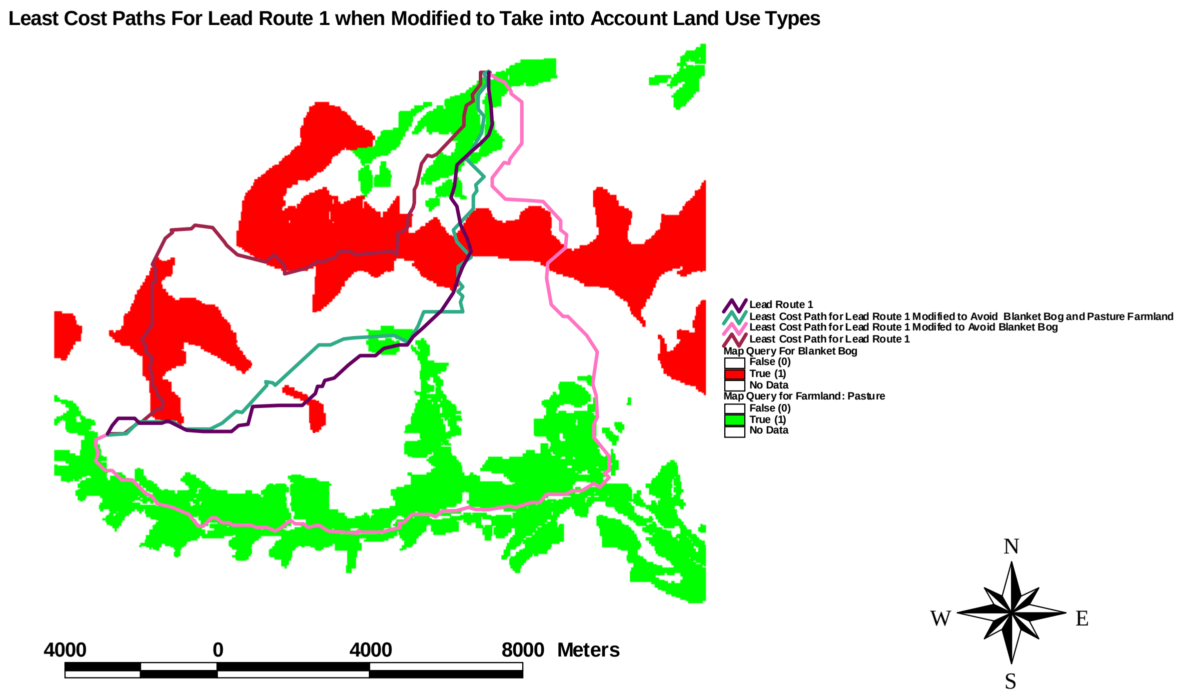


Figure 136: Least Cost Paths for Lead Route 1 When Modified to take into Account Different Land Use Types

12.6 Illustrations for Chapter 7: Roads, Routeways; Architecture, Lifestyles

Figure 137: Location of the Properties in Durham City.

Figure 138: Number 5 Framwellgate, Durham City

Figure 139: Stang End Long house, Hutton-le-Hole

Figure 140: Number 4 South Bailey, Durham City

Figure 141: The Bowes' Town House, now part of the Royal County Hotel, Durham city

Figure 142: Georgian Facades on North Bailey, Durham City

13 Tables

13.1.1 Difference in Route Lengths between the Distances Traversed and the Horizontal Distance plus the Difference in Lengths between the Roads and Routeways and the Least Cost Routes.

Base Routes	Total Distance Traversed (m)	Total Horizontal Distance (m)	Extra Distance Traversed (m)	Least Cost Routes	Total Distance Traversed (m)	Total Horizontal Distance (m)	Extra Distance Traversed (m)
Drove Roads				**Drove Roads**			
DroRo 01	36,888.80	36,750.00	138.80	DroRo 01	50,880.35	50,850.00	30.35
DroRo 02	44,815.41	44,700.00	115.41	DroRo 02	83,878.99	83,850.00	28.99
DroRo 03	41,968.98	41,850.00	118.98	DroRo 03	81,725.07	81,700.00	25.07
DroRo 04	39,142.01	39,050.00	92.01	DroRo 04	80,176.07	80,150.00	26.07
DroRo 05	41,470.46	41,400.00	70.46	DroRo 05	69,922.65	69,900.00	22.65
Roman Roads				**Roman Roads**			
RoR 01	34,518.35	34,500.00	18.35	RoR 01	52,960.27	52,950.00	10.27
RoR 02	11,656.93	11,650.00	6.93	RoR 02	16,703.57	16,700.00	3.57
RoR 03	36,613.60	36,550.00	63.60	RoR 03	57,024.40	57,000.00	24.40
RoR 04	12,163.98	12,150.00	13.98	RoR 04	18,603.56	18,600.00	3.56
RoR 05	33,734.48	33,700.00	34.48	RoR 05	57,608.67	57,600.00	8.67
Lead Routes				**Lead Routes**			
LeRo 01	18,064.41	18,000.00	64.41	LeRo 01	20,623.54	20,600.00	23.54
LeRo 02	1,510.32	1,500.00	10.32	LeRo 02	1,511.58	1,500.00	11.58
LeRo 03	1,554.44	1,550.00	4.44	LeRo 03	1,702.99	1,700.00	2.99
LeRo 04	5,118.27	5,100.00	18.27	LeRo 04	5,366.27	5,350.00	16.27
LeRo 05	5,314.88	5,300.00	14.88	LeRo 05	4,515.35	4,500.00	15.35
LeRo 06	2,859.63	2,850.00	9.63	LeRo 06	2,861.46	2,850.00	11.46
LeRo 07	9,558.23	9,550.00	8.23	LeRo 07	10,758.09	10,750.00	8.09

Table 1: Difference in Horizontal Distance, Distance Traversed, Route and Least Cost Route Lengths

13.1.2 Costs Associated with Varying Grid Cell Sizes

Route	Value	PathCost	Start Row	Start Column
Low Allers to Mine (5m cells)	3	6176.5	4587	3680
Low Allers to Race Head (5m cells)	3	15975.9	4748	4555
Total Cost From Mine to Race Head		22152.4		
Low Allers to Mine (20m cells)	3	7385.6	123	99
Low Allers to Race Head (20m cells)	3	17958.7	128	123
Total Cost From Mine to Race Head		25344.3		

Table 2: Grid Size and Changes in Cost.

13.1.3 Distances between Fixed Points

Section	Route Section	Horizontal Distances between points (m) Roman Road 5	Least Cost Path 5ii	Difference	% Difference
1	Start - Chester Le Street	2104	2200	96	4.6
2	Chester Le Street - Plasworth	3647	5371	1724	47.3
3	Plawsworth - Durham	5866	8630	2764	47.1
4	Durham - Bowburn	5735	8562	2827	49.3
5	Bowburn - Bishop Middleham	7232	14056	6824	94.4
6	Bishop Middleham - Sedgefield	2862	5554	2692	94.1
7	Sedgefield - End	6254	18327	12073	193.0
	Total	3370	62700	59330	1760.5

Table 3: Distances between Fixed Points for Roman Road 5 and Least Cost Route 5ii

13.1.4 Land Use Types Crossed by Drove Routes and the Least Cost Routes

Field Code	Land Use	County Durham	County Durham Area (sq m)	% Co Durham	Drove Route 1	Area Drove 1 (sq m)	% D1	Drove Route 2	Area Drove 2 (sq m)	% D2	Drove Route 3	Area Drove 3 (sq m)	% D3	Drove Route 4	Area Drove 4 (sq m)
18	Farmland: Arable	2302	5755000	0.26%	0	0	0.00%	88	220000	7.83%	84	210000	8.43%	134	335000
20	Farmland: Mixed	53198	132995000	5.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0
5	Farmland: Pasture	271001	677502500	30.35%	52	130000	5.84%	266	665000	23.67%	535	1337500	53.71%	521	1302500
22	Rough Grassland	27024	67560000	3.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0
6	Rough Grazing	911	2277500	0.10%	234	585000	26.26%	78	195000	6.94%	79	197500	7.93%	71	177500
10	Moorland: Grass	5146	12865000	0.58%	382	955000	42.87%	196	490000	17.44%	18	45000	1.81%	33	82500
8	Moorland: Grass/Heath	7716	19290000	0.86%	33	82500	3.70%	118	295000	10.50%	13	32500	1.31%	12	30000
14	Moorland: Grass/Bracken	20695	51737500	2.32%	0	0	0.00%	9	22500	0.80%	0	0	0.00%	0	0
11	Moorland: Heath	94979	237447500	10.64%	3	7500	0.34%	75	187500	6.67%	65	162500	6.53%	51	127500
2	Woodland: Broadleaved	3383	8457500	0.38%	4	10000	0.45%	18	45000	1.60%	52	130000	5.22%	101	252500
3	Woodland: Coniferous	152087	380217500	17.03%	5	12500	0.56%	82	205000	7.30%	58	145000	5.82%	21	52500
4	Woodland: Mixed	12985	32462500	1.45%	0	0	0.00%	0	0	0.00%	10	25000	1.00%	13	32500
24	Horticulture	12211	30527500	1.37%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0
21	Recreational Land	6153	15382500	0.69%	0	0	0.00%	21	52500	1.87%	4	10000	0.40%	0	0
17	Disturbed Land	9737	24342500	1.09%	0	0	0.00%	2	5000	0.18%	0	0	0.00%	0	0
15	Infrastructure	39207	98017500	4.39%	2	5000	0.22%	0	0	0.00%	0	0	0.00%	0	0
13	Urban	3193	7982500	0.36%	0	0	0.00%	32	80000	2.85%	66	165000	6.63%	18	45000
19	Industrial Land	57144	142860000	6.40%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0
1	Mineral Working	1441	3602500	0.16%	8	20000	0.90%	23	57500	2.05%	0	0	0.00%	1	2500
12	Moorland: Modified Bog	51215	128037500	5.73%	35	87500	3.93%	44	110000	3.91%	0	0	0.00%	0	0
9	Moorland: Blanket Bog	5483	13707500	0.61%	67	167500	7.52%	71	177500	6.32%	0	0	0.00%	0	0
16	Bare Rock and Scree	29437	73592500	3.30%	13	32500	1.46%	0	0	0.00%	0	0	0.00%	0	0
23	Foreshore	25240	63100000	2.83%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0
7	Water	1157	2892500	0.13%	53	132500	5.95%	1	2500	0.09%	12	30000	1.20%	10	25000
			2232612500	100.00%	891	2227500	100.00%	1124	2810000	100.00%	996	2490000	100.00%	986	2465000

Table 4: Land Use Types Crossed by the Drove Routes and their Least Cost Routes

Drove Route 5	Area Drove 5 (sq m)	% D5	LCD 1	Area LCD 1 (sq m)	% LCD1	LCD 2	Area LCD 2 (sq m)	% LCD 2	LCD 3	Area LCD 3 (sq m)	% LCD 3	LCD 4	Area LCD 4 (sq m)	% LCD 4	LCD 5	Area LCD 5 (sq m)	% LCD 5
457	1142500	40.51%	0	0	0.00%	388	970000	20.46%	601	1502500	33.19%	353	882500	24.65%	449	1122500	27.75%
17	42500	1.51%	0	0	0.00%	55	137500	2.90%	75	187500	4.14%	85	212500	5.94%	96	240000	5.93%
261	652500	23.14%	607	1517500	50.08%	656	1640000	34.60%	531	1327500	29.32%	486	1215000	33.94%	556	1390000	34.36%
4	10000	0.35%	6	15000	0.50%	2	5000	0.11%	21	52500	1.16%	0	0	0.00%	0	0	0.00%
7	17500	0.62%	246	615000	20.30%	28	70000	1.48%	18	45000	0.99%	46	115000	3.21%	40	100000	2.47%
0	0	0.00%	43	107500	3.55%	31	77500	1.64%	0	0	0.00%	0	0	0.00%	0	0	0.00%
2	5000	0.18%	14	35000	1.16%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
0	0	0.00%	39	97500	3.22%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
73	182500	6.47%	28	70000	2.31%	190	475000	10.02%	72	180000	3.98%	73	182500	5.10%	86	215000	5.32%
7	17500	0.62%	0	0	0.00%	16	40000	0.84%	16	40000	0.88%	0	0	0.00%	3	7500	0.19%
16	40000	1.42%	24	60000	1.98%	23	57500	1.21%	33	82500	1.82%	22	55000	1.54%	14	35000	0.87%
2	5000	0.18%	0	0	0.00%	0	0	0.00%	2	5000	0.11%	9	22500	0.63%	5	12500	0.31%
5	12500	0.44%	11	27500	0.91%	34	85000	1.79%	40	100000	2.21%	27	67500	1.89%	25	62500	1.55%
15	37500	1.33%	0	0	0.00%	1	2500	0.05%	25	62500	1.38%	4	10000	0.28%	5	12500	0.31%
10	25000	0.89%	7	17500	0.58%	14	35000	0.74%	23	57500	1.27%	43	107500	3.00%	43	107500	2.66%
222	555000	19.68%	16	40000	1.32%	154	385000	8.12%	296	740000	16.34%	182	455000	12.71%	239	597500	14.77%
14	35000	1.24%	0	0	0.00%	26	65000	1.37%	31	77500	1.71%	74	185000	5.17%	28	70000	1.73%
16	40000	1.42%	3	7500	0.25%	4	10000	0.21%	0	0	0.00%	0	0	0.00%	0	0	0.00%
0	0	0.00%	60	150000	4.95%	38	95000	2.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
0	0	0.00%	68	170000	5.61%	122	305000	6.43%	0	0	0.00%	0	0	0.00%	0	0	0.00%
0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
0	0	0.00%	40	100000	3.30%	114	285000	6.01%	27	67500	1.49%	28	70000	1.96%	29	72500	1.79%
1128	2820000	100.00%	1212	3030000	100.00%	1896	4740000	100.00%	1811	4527500	100.00%	1432	3580000	100.00%	1618	4045000	100.00%

Table 4: Continued

13.1.5 Land Use Types Crossed by Lead Routes and the Least Cost Routes

Field Code	Land Use	County Durham	County Durham Area (sq m)	% Co Durham	Lead Route 1	Area Lead 1 (sq m)	% L1	Lead Route 2	Area Lead 2 (sq m)	% L2	Lead Route 3	Area Lead 3 (sq m)	% L3	Lead Route 4	Area Lead 4 (sq m)
18	Farmland: Arable	2302	5755000	0.26%		0	0.00%		0	0.00%		0	0.00%		0
20	Farmland: Mixed	53198	1.33E+08	5.96%		0	0.00%		0	0.00%		0	0.00%		0
5	Farmland: Pasture	271001	6.78E+08	30.35%	64	160000	15.02%		0	0.00%		0	0.00%	54	135000
22	Rough Grassland	27024	67560000	3.03%		0	0.00%		0	0.00%		0	0.00%		0
6	Rough Grazing	911	2277500	0.10%	130	325000	30.52%	1	2500	2.70%		0	0.00%	26	65000
10	Moorland: Grass	5146	12865000	0.58%	110	275000	25.82%		0	0.00%		0	0.00%	36	90000
8	Moorland: Grass/Heath	7716	19290000	0.86%	53	132500	12.44%		0	0.00%		0	0.00%		0
14	Moorland: Grass/Bracken	20695	51737500	2.32%		0	0.00%		0	0.00%		0	0.00%		0
11	Moorland: Heath	94979	2.37E+08	10.64%		0	0.00%		0	0.00%		0	0.00%		0
2	Woodland: Broadleaved	3383	8457500	0.38%	4	10000	0.94%		0	0.00%		0	0.00%		0
3	Woodland: Coniferous	152087	3.8E+08	17.03%	10	25000	2.35%	10	25000	27.03%		0	0.00%		0
4	Woodland: Mixed	12985	32462500	1.45%		0	0.00%		0	0.00%		0	0.00%		0
24	Horticulture	12211	30527500	1.37%		0	0.00%		0	0.00%		0	0.00%		0
21	Recreational Land	6153	15382500	0.69%		0	0.00%		0	0.00%		0	0.00%		0
17	Disturbed Land	9737	24342500	1.09%	5	12500	1.17%		0	0.00%		0	0.00%		0
15	Infrastructure	39207	98017500	4.39%		0	0.00%		0	0.00%		0	0.00%		0
13	Urban	3193	7982500	0.36%	8	20000	1.88%		0	0.00%		0	0.00%	1	2500
19	Industrial Land	57144	1.43E+08	6.40%		0	0.00%		0	0.00%		0	0.00%		0
1	Mineral Working	1441	3602500	0.16%		0	0.00%		0	0.00%		0	0.00%		0
12	Moorland: Modified Bog	51215	1.28E+08	5.73%	13	32500	3.05%		0	0.00%		0	0.00%		0
9	Moorland: Blanket Bog	5483	13707500	0.61%	29	72500	6.81%	26	65000	70.27%	35	87500	100.00%		0
16	Bare Rock and Scree	29437	73592500	3.30%		0	0.00%		0	0.00%		0	0.00%		0
23	Foreshore	25240	63100000	2.83%		0	0.00%		0	0.00%		0	0.00%		0
7	Water	1157	2892500	0.13%		0	0.00%		0	0.00%		0	0.00%	1	2500
		893045	2.23E+09	100.00%	426	1065000	100.00%	37	92500	100.00%	35	87500	100.00%	118	295000

Table 5: Land Use Types Crossed by Lead Routes and their Least Cost Routes

Lead Route 5	Area Lead 5 (sq m)	% L5	Lead Route 6	Area Lead 6 (sq m)	% L6	Lead Route 7	Area Lead 7 (sq m)	% L7	LCL 1	Area LCL 1 (sq m)	% LCL1	LCL 2	Area LCL 2 (sq m)	% LCL 2	LCL 3	Area LCL 3 (sq m)	% LCL 3
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%	10	25000	14.29%	9	22500	3.95%	48	120000	10.60%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
38	95000	30.89%	24	60000	34.29%	4	10000	1.75%	28	70000	6.18%	1	2500	2.78%		0	0.00%
55	137500	44.72%	34	85000	48.57%	37	92500	16.23%	5	12500	1.10%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%	9	22500	3.95%	27	67500	5.96%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%	143	357500	62.72%	30	75000	6.62%		0	0.00%		0	0.00%
2	5000	1.63%		0	0.00%		0	0.00%	4	10000	0.88%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%	11	27500	2.43%	10	25000	27.78%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%	2	5000	2.86%	1	2500	0.44%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%	77	192500	17.00%		0	0.00%		0	0.00%
28	70000	22.76%		0	0.00%	25	62500	10.96%	223	557500	49.23%	25	62500	69.44%	38	95000	100.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
	0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%		0	0.00%
123	307500	100.00%	70	175000	100.00%	228	570000	100.00%	453	1132500	100.00%	36	90000	100.00%	38	95000	100.00%

Table 5: Continued

Field Code	Land Use	LCL 4	Area LCL 4 (sq m)	% LCL 4	LCL 5	Area LCL 5 (sq m)	% LCL 5	LCL 6	Area LCL 6 (sq m)	% LCL 6	LCL 7	Area LCL 7 (sq m)	% LCL 7
18	Farmland: Arable		0	0.00%		0	0.00%		0	0.00%		0	0.00%
20	Farmland: Mixed		0	0.00%		0	0.00%		0	0.00%		0	0.00%
5	Farmland: Pasture	51	127500	40.16%	31	77500	29.25%	4	10000	5.63%	8	20000	18.18%
22	Rough Grassland		0	0.00%		0	0.00%		0	0.00%		0	0.00%
6	Rough Grazing	26	65000	20.47%	26	65000	24.53%	23	57500	32.39%		0	0.00%
10	Moorland: Grass	39	97500	30.71%		0	0.00%	43	107500	60.56%	3	7500	6.82%
8	Moorland: Grass/Heath		0	0.00%	37	92500	34.91%		0	0.00%		0	0.00%
14	Moorland: Grass/Bracken		0	0.00%		0	0.00%		0	0.00%		0	0.00%
11	Moorland: Heath		0	0.00%		0	0.00%		0	0.00%	11	27500	25.00%
2	Woodland: Broadleaved		0	0.00%		0	0.00%		0	0.00%		0	0.00%
3	Woodland: Coniferous		0	0.00%		0	0.00%		0	0.00%		0	0.00%
4	Woodland: Mixed		0	0.00%		0	0.00%		0	0.00%		0	0.00%
24	Horticulture		0	0.00%		0	0.00%		0	0.00%		0	0.00%
21	Recreational Land		0	0.00%		0	0.00%		0	0.00%		0	0.00%
17	Disturbed Land		0	0.00%		0	0.00%		0	0.00%		0	0.00%
15	Infrastructure	5	12500	3.94%		0	0.00%		0	0.00%		0	0.00%
13	Urban	6	15000	4.72%	10	25000	9.43%	1	2500	1.41%	2	5000	4.55%
19	Industrial Land		0	0.00%		0	0.00%		0	0.00%		0	0.00%
1	Mineral Working		0	0.00%		0	0.00%		0	0.00%		0	0.00%
12	Moorland: Modified Bog		0	0.00%		0	0.00%		0	0.00%		0	0.00%
9	Moorland: Blanket Bog		0	0.00%	2	5000	1.89%		0	0.00%	20	50000	45.45%
16	Bare Rock and Scree		0	0.00%		0	0.00%		0	0.00%		0	0.00%
23	Foreshore		0	0.00%		0	0.00%		0	0.00%		0	0.00%
7	Water		0	0.00%		0	0.00%		0	0.00%		0	0.00%
		127	317500	100.00%	106	265000	100.00%	71	177500	100.00%	44	110000	100.00%

Table 5: Continued

14 Appendices

14.1 Appendix 1

14.1.1 Classification of Crop marks: LINEAR FEATURE

RCMHE Methodology

GREENCROFT (North)

Feature	Linear Feature (Roman road)
Type	Linear
Pattern	Single
Shape	Straight
Form	Foundation
Continuity	Interrupted
Entrance	No
Number of Entrances	/
Definition Check	Linear Feature
Route	NE-SW

Additional Information

National Grid Reference	NZ1455049450
County and Parish	Durham, Greencroft
Mark Type	Crop Mark
Possible Period	Roman road
Threat	Ploughing
Land Use	Agriculture
Location Of Photograph	Archaeological Services, Durham University
Negative Number	13/3
Method of Rectification	Aerial5
Included in HER?	NO

14.1.2 Classification of Crop marks: LINEAR FEATURE

RCMHE Methodology

LOW ALLERS

Feature	Linear features
Type	Linear
Pattern	Multiple
Shape	Straight, parallel
Form	
Continuity	Interrupted
Entrance	No
Number of Entrances	None
Definition Check	Linear Feature
Route	SSW-NNE

Additional Information

National Grid Reference	NZ384540
County and Parish	Durham, Stanhope
Mark Type	Crop mark
Possible Period	17^{th} – 18^{th} century
Threat	None
Land Use	Pasture
Location Of Photograph	Archaeological Services, Durham University
Negative Number	13/4
Method of Rectification	Aerial5
Included in HER?	No

14.2 Appendix 2

14.2.1 Historic Environment Records Pertaining to the Roads and Routeways of County Durham and their Associated Features

EARLY MEDIEVAL ROADS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Durham City, South Street	5299	427000	540000	Early Medieval - C5 to AD1066	Road

HOLLOW WAYS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Scargill Castle	5608	405100	510540	Medieval - AD1066 to AD1540	Manor / Settlement / Field System
1.2	Scargill Castle	5608	405180	510670	Medieval - AD1066 to AD1540	Manor / Settlement / Field System
1.3	Scargill Castle	5608	405240	510810	Medieval - AD1066 to AD1540	Manor / Settlement / Field System
1.4	Scargill Castle	5608	405360	510670	Medieval - AD1066 to AD1540	Manor / Settlement / Field System
2.1	Stanhope	8142	391582	537400	Post Medieval - AD1541 to AD1899	Hollow Way
3.1	Stanhope Park	8714	396113	538245	Roman - AD70 to C5	Hollow Way
4.1	Horsley Burn Valley	9147	395758	537156	Roman - AD70 to C5	Hollow Way
4.2	Horsley Burn Valley	9147	395802	537254	Roman - AD70 to C5	Hollow Way
4.3	Horsley Burn Valley	9147	395828	537336	Roman - AD70 to C5	Hollow Way
5.1	Horsley Burn Farm	9154	397444	538367	Undetermined	Hollow Way
6.1	Horsley Burn Valley	9177	397041	538237	Undetermined	Hollow Way (S.E. Horsley Hall)
7.1	Stanhope Park	9354	395636	538398	Undetermined	Hollow Way
8.1	Stanhope Park (Phase 2)	9420	??	??	Roman - AD70 to C5	Hollow Way (Co-ordinates not given on PRN)
9.1	Stanhope Park (Phase 2)	9442	??	??	Undetermined	Hollow Way (Co-ordinates not given on PRN)
10.1	Stanhope Park (Phase 3)	9726	396881	537814	Prehistoric - to AD70	Route Way
11.1	Stanhope Park (Phase 3)	9727	396803	537784	Roman - AD70 to C5	Bank
12.1	Stanhope Park (Phase 3)	9773	395890	538285	Undetermined	Linear Hollow
13.1	Stanhope Park (Phase 3)	9777	397446	538635	Undetermined	Linear Hollow
14.1	Stanhope Park (Phase 3)	9782	395899	538257	Undetermined	Linear Hollow
15.1	Stanhope Park (Phase 3)	9794	396112	538322	Undetermined	Linear Hollow
16.1	Stanhope Park (Phase 3)	9846	395857	535835	Undetermined	Bank
17.1	Stanhope Park (Phase 3)	9860	395263	536681	Medieval - AD1066 to AD1540	Linear Hollow

LEAD MINES

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Westgate, Slit Mine	46	390600	539200	Post Medieval - AD1541 to AD1899	Lead Mine
2.1	Westgate, Middlehope Shield Mine	49	390500	539600	Post Medieval - AD1541 to AD1899	Lead Mine
3.1	Weardale, Burnhope	192	384000	538000	Medieval - AD1066 to AD1540	Lead Mine
4.1	Ireshopeburn	199	386000	537000	Medieval - AD1066 to AD1540	Lead Mine
5.1	Daddry Shields	214	389000	537000	Medieval - AD1066 to AD1540	Lead Mine
6.1	St. John's Chapel, Blackdean	215	388000	538000	Medieval - AD1066 to AD1540	Lead Mine

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
7.1	Daddry Shields	216	389000	537000	Medieval - AD1066 to AD1540	Lead Mine
8.1	Wearhead, Oklwoodclough	217	387000	539000	Medieval - AD1066 to AD1540	Lead Mine
9.1	Langdon Beck, Cow Green	241	381100	530600	Post Medieval - AD1541 to AD1899	Lead Mine
10.1	Rookhope, Brandon Walls	455	394700	541100	Post Medieval - AD1541 to AD1899	Lead Mine
11.1	Cowshill, Burtree Pasture	804	385800	541000	Post Medieval - AD1541 to AD1899	Lead Mine
12.1	Landon Beck, South Langtae	866	381300	536100	Post Medieval - AD1541 to AD1899	Lead working site
13.1	Stanhope, Bollihope	868	398700	541300	Post Medieval - AD1541 to AD1899	Lead Mine
14.1	Holwick, Lunehead	985	384700	520700	Post Medieval - AD1541 to AD1899	Lead Crushing Plant
15.1	Holwick, Lunehead	986	385400	520400	Post Medieval - AD1541 to AD1899	Lead workings
16.1	Eastgate, Cambokeels Mine	2300	393390	538270	Post Medieval - AD1541 to AD1899	Lead Mine
17.1	Bowlees, Leonard's Hush	2304	390500	531500	Post Medieval - AD1541 to AD1899	Lead Mine
18.1	Scargill, Ellerbeck Mine	2428	399090	510325	Post Medieval - AD1541 to AD1899	Lead Mine
19.1	Edmundbyers, Eudon Groove Shop	3035	398100	545800	Post Medieval - AD1541 to AD1899	Lead Mine shop
20.1	Edmundbyers, Burnhope Mine	3036	400300	548800	Post Medieval - AD1541 to AD1899	Lead Mine
21.1	Bollihope Common, Whitfield Brow	3220	400000	534000	Post Medieval - AD1541 to AD1899	Lead Mine
22.1	Holwick, Greenmines Shop	3221	381300	526700	Post Medieval - AD1541 to AD1899	Lead Mine shop
23.1	Holwick, Millings Shop	3222	383770	526440	Post Medieval - AD1541 to AD1899	Lead Mine shop
24.1	Holwick, Silverband Shop	3223	383750	527090	Post Medieval - AD1541 to AD1899	Lead Mine shop
25.1	Scargill	3322	400930	509150	Post Medieval - AD1541 to AD1899	Lead Mine
26.1	Eastgate, Brandon Walls Mine	3499	394700	541200	Post Medieval - AD1541 to AD1899	Lead Mine
27.1	Rookhope, Thorney Brow	3500	394800	541600	Post Medieval - AD1541 to AD1899	Lead Mine
28.1	Stanhope Common, Mogshaw Syke	3675	400300	540300	Medieval - AD1066 to AD1540	Lead Mine
28.2	Stanhope Common, Mogshaw Syke	3675	400815	539793	Medieval - AD1066 to AD1540	Lead Mine
28.3	Stanhope Common, Mogshaw Syke	3675	400843	540080	Medieval - AD1066 to AD1540	Lead Mine
28.4	Stanhope Common, Mogshaw Syke	3675	400845	539775	Medieval - AD1066 to AD1540	Lead Mine
29.1	Rookhope, Stotfield Burn	3824	394300	542300	Post Medieval - AD1541 to AD1899	Lead Mine
30.1	Killhope, Park Level	3861	382680	542990	Post Medieval - AD1541 to AD1899	Lead Mine
31.1	Middleton-in-Teesdale, Coldberry	3869	393300	528970	Post Medieval - AD1541 to AD1899	Lead Mine
32.1	Daddry Shield, Middle Greenlaws	3873	388940	536970	Post Medieval - AD1541 to AD1899	Lead Mine
33.1	Hunstanworth, Derwent Lead Mines	3888	395520	547890	Post Medieval - AD1541 to AD1899	Lead Mine and Smelting Site
34.1	Langdon Beck, Lady's Rake	3971	380600	534270	Post Medieval - AD1541 to AD1899	Lead Mine
35.1	Langdon Beck, Green Hurth	3972	378000	532730	Post Medieval - AD1541 to AD1899	Lead Mine and Ore Works
36.1	Newbiggin, Pike Law	3973	390360	531470	Post Medieval - AD1541 to AD1899	Lead Mine
37.1	Harwood in Teesdale, West Cow Green	3979	380930	530880	Post Medieval - AD1541 to AD1899	Lead Mine
38.1	Harwood in Teesdale, East Cow Green	3980	381700	530390	Post Medieval - AD1541 to AD1899	Lead and Barytes Mine
39.1	Harwood in Teesdale, East Cow Green	3981	381820	530930	Post Medieval - AD1541 to AD1899	Lead and Barytes Mine
40.1	Langdon Beck, Dubby Sike, Cow Green	3986	379513	531954	Post Medieval - AD1541 to AD1899	Lead and Barytes Mine
41.1	Harwood in Teesdale, Cow Rake	3989	382360	531260	Post Medieval - AD1541 to AD1899	Lead Mine
42.1	Harwood in Teesdale, Middle Vein	3990	382160	531140	Post Medieval - AD1541 to AD1899	Open Barytes Cutting
43.1	Harwood in Teesdale, Pikestone Hurth	3992	380050	532160	Post Medieval - AD1541 to AD1899	Lead Mine
44.1	Harwood in Teesdale, Sevedary Sike	3993	381200	532860	Post Medieval - AD1541 to AD1899	Lead Mine

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
45.1	Harwood in Teesdale, Touting Hill Sike	3994	381650	532570	Post Medieval - AD1541 to AD1899	Lead Mine
46.1	Harwood in Teesdale, Touting Sike	3995	381500	532420	Post Medieval - AD1541 to AD1899	Lead Mine
47.1	Harwood in Teesdale, High Stoney Cowls	3996	381620	532800	Post Medieval - AD1541 to AD1899	Lead Mine
48.1	Langdon Beck, The Bands	4001	383660	532720	Post Medieval - AD1541 to AD1899	Lead Mine
49.1	Harwood in Teesdale, Reddy Combe	4006	380200	533550	Post Medieval - AD1541 to AD1899	Lead Mine
50.1	Harwood in Teesdale, Willyhole	4007	380500	533600	Post Medieval - AD1541 to AD1899	Lead and Zinc Mine
51.1	Harwood in Teesdale, Willyhole	4008	380800	533240	Post Medieval - AD1541 to AD1899	Lead Mine
52.1	Harwood in Teesdale, Drygill	4013	381940	533960	Post Medieval - AD1541 to AD1899	Lead(?) Mine
53.1	Harwood in Teesdale, North of Herdship	4014	381350	533810	Post Medieval - AD1541 to AD1899	Lead Mine
54.1	Harwood in Teesdale, The Bands	4018	383040	533260	Post Medieval - AD1541 to AD1899	Lead Mine
55.1	Harwood in Teesdale, Three Pikes	4021	383250	533940	Post Medieval - AD1541 to AD1899	Lead Mine
56.1	Langdon Beck, Langdon Common	4022	384540	533230	Post Medieval - AD1541 to AD1899	Lead Mine and workings
57.1	Langdon Beck, Langdon	4023	384600	533990	Post Medieval - AD1541 to AD1899	Lead Mine and workings
58.1	Harwood in Teesdale, Grasshill	4036	381230	534840	Post Medieval - AD1541 to AD1899	Lead Mine
59.1	Harwood in Teesdale, Scar Head	4037	381460	534230	Post Medieval - AD1541 to AD1899	Lead Mine
60.1	Harwood in Teesdale, Fair Play	4038	381870	534170	Post Medieval - AD1541 to AD1899	Lead Mine
61.1	Harwood in Teesdale, Trough Head	4040	382280	534430	Post Medieval - AD1541 to AD1899	Lead Mine
62.1	Harwood in Teesdale, North of Top Hill	4041	382430	534060	Post Medieval - AD1541 to AD1899	Lead Workings
63.1	Harwood in Teesdale, Trough Head	4042	382700	534600	Post Medieval - AD1541 to AD1899	Lead Workings
64.1	Harwood in Teesdale, Three Pikes	4044	383300	534000	Post Medieval - AD1541 to AD1899	Lead Mine
65.1	Langdon Beck, Langdon Head	4045	384630	534780	Post Medieval - AD1541 to AD1899	Lead Workings
66.1	Langdon Beck, Langdon Low Level	4046	384750	534330	Post Medieval - AD1541 to AD1899	Lead Mine
67.1	Harwood in Teesdale, Ashgill Head	4048	380800	535500	Post Medieval - AD1541 to AD1899	Lead Mine
68.1	Harwood in Teesdale, Hawk Sike	4049	381810	535040	Post Medieval - AD1541 to AD1899	Lead Miner's Shop
69.1	Harwood in Teesdale, South Langtae Sike	4050	381080	535850	Post Medieval - AD1541 to AD1899	Lead Mine Workings
70.1	Harwood in Teesdale, Highfield Hushes	4051	381700	535500	Post Medieval - AD1541 to AD1899	Lead Workings
71.1	Harwood in Teesdale, Coldberry	4052	382800	535700	Post Medieval - AD1541 to AD1899	Lead Workings and Miner's Shop
72.1	Harwood in Teesdale, Manor Gill	4053	381450	535740	Post Medieval - AD1541 to AD1899	Lead Mine and Workings
73.1	Harwood in Teesdale, South Langtae Sike 2	4054	381240	536000	Post Medieval - AD1541 to AD1899	Lead Mine Workings
74.1	Harwood in Teesdale, Blackway Hush	4055	382200	535500	Post Medieval - AD1541 to AD1899	Lead Mine Workings
75.1	Ireshopeburn, Pencilcleugh Level	4056	383650	535570	Post Medieval - AD1541 to AD1899	Lead Mine and preparation Site
76.1	Harwood in Teesdale, Ashgill Head	4059	380540	536130	Post Medieval - AD1541 to AD1899	Lead Mine
77.1	Burnhope, Lantae Head	4060	381670	536490	Post Medieval - AD1541 to AD1899	Lead Workings
78.1	Burnhope, Langtae Head	4061	381710	536800	Post Medieval - AD1541 to AD1899	Lead Mine
79.1	Harwood in Teesdale, Great Stony Hill	4063	381830	536370	Post Medieval - AD1541 to AD1899	Lead Workings
80.1	Harwood in Teesdale, Great Stony Head	4064	382690	536190	Post Medieval - AD1541 to AD1899	Lead Workings
81.1	Burnhope, Blue Heap	4065	382450	536800	Post Medieval - AD1541 to AD1899	Lead Mine
82.1	Ireshopeburn, Broadsike Levels	4066	384490	536830	Post Medieval - AD1541 to AD1899	Lead Mine
83.1	Ireshopeburn, Clints Crag	4069	384450	536680	Post Medieval - AD1541 to AD1899	Lead Mine
84.1	Ireshopeburn, Deepcleugh Level	4073	384430	536280	Post Medieval - AD1541 to AD1899	Lead Mine
85.1	Ireshopeburn, Grooves Cleugh	4074	384200	536100	Post Medieval - AD1541 to AD1899	Lead Mine

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
86.1	Ireshopeburn, Coldberry	4076	383440	536050	Post Medieval - AD1541 to AD1899	Lead Mine
87.1	Burnhope, Lodgegill Lead Mine	4077	380200	537500	Post Medieval - AD1541 to AD1899	Lead Mine
88.1	Burnhope, Em's Hush	4078	382130	537300	Post Medieval - AD1541 to AD1899	Lead Workings, Open cut
89.1	Burnhope, Smith's Hush	4079	382620	537880	Post Medieval - AD1541 to AD1899	Lead Workings, Open cut
90.1	St. John's Chapel, Green Groves	4080	387410	537510	Post Medieval - AD1541 to AD1899	Lead Mine
91.1	Ireshopeburn, Lodge Sike Mine	4081	384570	537120	Post Medieval - AD1541 to AD1899	Lead Mine and washing floor
92.1	Burnhope, Black Rigg	4082	384800	537800	Post Medieval - AD1541 to AD1899	Lead Workings
93.1	Burnhope, Green Slit	4083	380300	538900	Post Medieval - AD1541 to AD1899	Lead Workings, Open cut
94.1	Burnhope, Broad Pot	4084	380380	538600	Post Medieval - AD1541 to AD1899	Lead Mine
95.1	Burnhope, Burnhope Moor	4087	382250	538480	Post Medieval - AD1541 to AD1899	Lead Mine Workings
96.1	Burnhope, Burnhope Moor	4089	383080	538490	Post Medieval - AD1541 to AD1899	Lead Mine Workings
97.1	Burnhope, Burnhope Pasture	4090	383800	538800	Post Medieval - AD1541 to AD1899	Lead Mine Workings
98.1	Burnhope, Burnhope	4093	383000	538000	Medieval - AD1066 to AD1540	Lead Mine
99.1	Burnhope, Poppet Level	4106	381410	539470	Post Medieval - AD1541 to AD1899	Lead Mine
100.1	Burnhope, Sally Grain Level	4107	381190	539110	Post Medieval - AD1541 to AD1899	Lead Mine
101.1	Burnhope, Black Cleugh	4124	384510	539690	Post Medieval - AD1541 to AD1899	Lead Workings
102.1	Landon Beck, Underherth	4133	386200	530700	Post Medieval - AD1541 to AD1899	Lead level
103.1	Forest-in-Teesdale	4134	387380	530880	Post Medieval - AD1541 to AD1899	Lead Mine
104.1	Newbiggin, Binks Edge	4136	388800	530800	Post Medieval - AD1541 to AD1899	Lead Workings
105.1	Langdon Beck, Velance Lodge	4144	385800	531600	Post Medieval - AD1541 to AD1899	Lead Mine
106.1	Langdon Beck, Velance Lodge	4145	386090	531890	Post Medieval - AD1541 to AD1899	Lead Mine Level
107.1	Ettersgill, Gill Shop	4150	388520	531160	Post Medieval - AD1541 to AD1899	Lead Mine and Bothy
108.1	Langdon Beck, High Hurth Edge	4153	386450	531320	Post Medieval - AD1541 to AD1899	Lead Mine Open Cut
109.1	Ettersgill, Longmere Sike Hushes	4154	389470	531920	Post Medieval - AD1541 to AD1899	Lead Workings
110.1	Ettersgill, Westerhead	4155	389600	531900	Post Medieval - AD1541 to AD1899	Lead Workings
111.1	Ettersgill, Wester Beck	4156	389770	531770	Post Medieval - AD1541 to AD1899	Lead Mine Hush
112.1	Ireshopeburn, Hart Hope	4159	385720	536290	Post Medieval - AD1541 to AD1899	Lead Workings
113.1	Ettersgil, Fendrith Hill	4162	388200	532590	Post Medieval - AD1541 to AD1899	Lead Mine Workings
114.1	Newbiggin, Blacklaw Moss	4163	388620	532310	Post Medieval - AD1541 to AD1899	Lead Mine Workings
115.1	Langdon Beck, Langdon	4164	386900	531400	Post Medieval - AD1541 to AD1899	Lead Mining
116.1	Langdon Beck, West Beck, Langdon Common	4171	385600	534420	Post Medieval - AD1541 to AD1899	Lead Mine Workings
117.1	Daddry Shield, Swinhope Head Grooves	4177	388550	534250	Post Medieval - AD1541 to AD1899	Lead Workings, Open cut
118.1	St. John's Chapel, Harthope Old Mine	4186	387070	535920	Post Medieval - AD1541 to AD1899	Lead Mine
119.1	St. John's Chapel, Greenlaws Vein	4189	387420	536400	Post Medieval - AD1541 to AD1899	Lead Workings
119.2	St. John's Chapel, Greenlaws Vein	4189	387900	536400	Post Medieval - AD1541 to AD1899	Lead Workings
120.1	St. John's Chapel, Lingly Rigg	4191	388440	536520	Post Medieval - AD1541 to AD1899	Lead Workings
121.1	St. John's Chapel, Greenlaws Lead Mine	4192	388250	536750	Post Medieval - AD1541 to AD1899	Lead Mine
122.1	St. John's Chapel, Lingly Rigg	4193	388630	536710	Post Medieval - AD1541 to AD1899	Lead Mine
123.1	Cotherstone, Hunder Beck	4199	391500	516400	Post Medieval - AD1541 to AD1899	Lead Mine
124.1	Ireshopeburn, Grove Heads	4204	385600	537550	Post Medieval - AD1541 to AD1899	Lead Mine
125.1	Daddry Shield, Windyside Fell	4205	389780	536670	Post Medieval - AD1541 to AD1899	Lead Workings

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
126.1	St. John's Chapel, Rowantree Sike	4216	386780	537380	Post Medieval - AD1541 to AD1899	Lead Mine
127.1	St. John's Chapel, Grooveheads Lead Vein	4217	386020	537690	Post Medieval - AD1541 to AD1899	Lead Workings
128.1	St. John's Chapel, Harthope	4219	387850	537460	Post Medieval - AD1541 to AD1899	Lead Mine
129.1	Daddry Shield, Greenlaws Middle Level	4225	388980	537020	Post Medieval - AD1541 to AD1899	Lead Mine
130.1	Daddry Shield, Daddryshield Burn	4230	388990	537380	Post Medieval - AD1541 to AD1899	Lead Mine Shaft
131.1	Ireshopeburn, Broadsike Levels	4232	384380	538640	Post Medieval - AD1541 to AD1899	Lead Workings
131.2	Ireshopeburn, Broadsike Levels	4232	384490	536830	Post Medieval - AD1541 to AD1899	Lead Workings
132.1	Ireshopeburn, Carrick's Quarry	4237	386130	537949	Post Medieval - AD1541 to AD1899	Lead Mine
133.1	St. John's Chapel, Greenlaws Vein	4238	387100	535800	Post Medieval - AD1541 to AD1899	Lead Workings
133.2	St. John's Chapel, Greenlaws Vein	4238	389400	537600	Post Medieval - AD1541 to AD1899	Lead Workings
134.1	Ireshopeburn, Barbary Lead Mine	4246	386500	538500	Post Medieval - AD1541 to AD1899	Lead Mine
135.1	Ireshopeburn, Earnwell Sike	4253	386300	538210	Post Medieval - AD1541 to AD1899	Lead Workings
135.2	Ireshopeburn, Earnwell Sike	4253	386700	538410	Post Medieval - AD1541 to AD1899	Lead Workings
136.1	St. John's Chapel, Blackdean Lead Mine	4255	386840	538910	Medieval - AD1066 to AD1540	Lead Mine
137.1	Ireshopeburn, Old Fall	4257	387240	538960	Post Medieval - AD1541 to AD1899	Lead Mine
138.1	St. John's Chapel, Levelgate Lead Mine	4260	388210	538750	Post Medieval - AD1541 to AD1899	Lead Mine
139.1	St. John's Chapel, Bleaklow Lead Mine	4270	389070	538870	Post Medieval - AD1541 to AD1899	Lead Mine
140.1	Wearhead, Wearhead	4280	385850	539620	Post Medieval - AD1541 to AD1899	Lead Mine
141.1	Wearhead, Bellhill Quarry	4282	386450	539400	Post Medieval - AD1541 to AD1899	Lead Mine, Ironstoneand Limestone
142.1	Wearhead, Wearhead Lead Mines 2	4284	386150	539750	Post Medieval - AD1541 to AD1899	Lead Mine and Ironstone
143.1	Wearhead, Sparke's Pasture Level	4292	386260	539820	Post Medieval - AD1541 to AD1899	Lead Mine level
144.1	Wearhead, Weardale Open Cut	4293	386000	539700	Post Medieval - AD1541 to AD1899	Lead Mine open cut
145.1	Weardale, Elmford Mine	4296	386990	539680	Post Medieval - AD1541 to AD1899	Lead and Fluorspar Mine
146.1	Wearhead, Cornfield House	4297	386560	539680	Post Medieval - AD1541 to AD1899	Lead Mine
147.1	Wearhead, Wearhead 2	4298	386100	539710	Post Medieval - AD1541 to AD1899	Lead Mine workings
148.1	Ireshopeburn, Longfield Vein	4306	387320	539050	Post Medieval - AD1541 to AD1899	Lead and Fluorspar Mine
149.1	Ireshopeburn, Silverdykes Mine	4307	387900	539360	Post Medieval - AD1541 to AD1899	Lead Mine
150.1	Ireshopeburm, Allercleugh 1	4308	387520	539530	Post Medieval - AD1541 to AD1899	Lead Mine workings
151.1	Ireshopeburm, Allercleugh Fell	4310	387220	539730	Post Medieval - AD1541 to AD1899	Lead Mine workings
152.1	St. John's Chapel, Rakes Bridge	4313	388150	539230	Post Medieval - AD1541 to AD1899	Lead workings
153.1	Ireshopeburn, Carr Brow Moor 1	4314	388260	539550	Post Medieval - AD1541 to AD1899	Lead workings
154.1	St.John's Chapel, High Slitt Mine	4318	389390	539390	Post Medieval - AD1541 to AD1899	Lead Mine
155.1	Ireshopeburn, Carr Brow Moor 2	4319	389020	539050	Post Medieval - AD1541 to AD1899	Lead Mine and workings
156.1	St. John's Chapel, Olwoodclough Mine	4341	389000	539000	Medieval - AD1066 to AD1540	Lead Mine
157.1	Daddry Shield, Quarry Level	4343	389400	537610	Post Medieval - AD1541 to AD1899	Lead Mine
158.1	Maize Beck	4347	379920	526790	Post Medieval - AD1541 to AD1899	Lead Mine
159.1	Maize Beck, long Sike	4348	379660	525610	Post Medieval - AD1541 to AD1899	Lead Workings
160.1	Backside Fell	4385	378810	378810	Post Medieval - AD1541 to AD1899	Lead Mine
161.1	Harwood in Teesdale, Muses Level	4386	378770	531590	Post Medieval - AD1541 to AD1899	Lead Mine
162.1	Harwood in Teesdale, Dubbysike Level	4389	379320	531630	Post Medieval - AD1541 to AD1899	Lead Mine
163.1	Harwood in Teesdale, Dubbysike Hush	4390	379000	531600	Post Medieval - AD1541 to AD1899	Lead Mine Workings

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
164.1	Harwood in Teesdale, Greenhurth Mine	4391	377890	532750	Post Medieval - AD1541 to AD1899	Lead Mine Workings
165.1	Harwood in Teesdale, Smithy Sike Level	4392	377520	532920	Post Medieval - AD1541 to AD1899	Lead Mine
166.1	Harwood in Teesdale, Cadger Well	4395	379700	534820	Post Medieval - AD1541 to AD1899	Lead Mine
167.1	Harwood in Teesdale, Crookburn Mine	4396	378280	534450	Post Medieval - AD1541 to AD1899	Lead Mine
168.1	Harwood in Teesdale, Yad Moss Level	4398	378860	535870	Post Medieval - AD1541 to AD1899	Lead Mine
169.1	Harwood in Teesdale, Yad Moss 2	4401	378700	536190	Post Medieval - AD1541 to AD1899	Lead Mine
170.1	St. John's Chapel, Scraith Head Mine	4404	379450	537230	Post Medieval - AD1541 to AD1899	Lead workings
171.1	Harwood in Teesdale, Crookburn Mineshaft	4406	377800	534800	Post Medieval - AD1541 to AD1899	Lead Mine
172.1	St. John's Chapel, Lodgehill Mine	4407	379800	537500	Post Medieval - AD1541 to AD1899	Lead Mine
173.1	St. John's Chapel, Drysike Hush	4408	379500	537470	Post Medieval - AD1541 to AD1899	Lead Workings
174.1	Lunedale, Dirty Pool	4420	383400	519200	Post Medieval - AD1541 to AD1899	Lead Mine
175.1	Lunedale, Rowton sike	4421	384050	384050	Post Medieval - AD1541 to AD1899	Lead Mine
176.1	Lunedale, Lune Head	4435	384640	520570	Post Medieval - AD1541 to AD1899	Lead and Barytes Mine
177.1	Lunedale, Lune Forest	4436	384560	520110	Post Medieval - AD1541 to AD1899	Lead Mine
178.1	Lunedale, Close House Old Mine	4441	384140	522400	Post Medieval - AD1541 to AD1899	Lead Mine
179.1	Lunedale, Closehouse	4442	384820	522670	Post Medieval - AD1541 to AD1899	Lead and Barytes Mine
180.1	Merrygill Moss, Birkdal Mine	4446	381750	527390	Post Medieval - AD1541 to AD1899	Lead Mine
181.1	Lunedalem Mickle Fell	4450	381500	524640	Post Medieval - AD1541 to AD1899	Lead Mine
182.1	Lunedale, Black Band	4452	382680	525740	Post Medieval - AD1541 to AD1899	Lead Mine
183.1	Lunedale, Green (Maizebeck) Mines	4454	380730	526300	Post Medieval - AD1541 to AD1899	Lead Mine
184.1	Forest-in-Teesdale, Silverband	4462	383670	527150	Post Medieval - AD1541 to AD1899	Lead Mine
185.1	Forest & Frith, Black Ark	4463	384420	527760	Post Medieval - AD1541 to AD1899	Lead Mine
186.1	Lunedale, Lunehead 1	4475	385650	520180	Post Medieval - AD1541 to AD1899	Lead Mine
187.1	Lunedale, Close House Mine	4489	385300	522800	Post Medieval - AD1541 to AD1899	Lead and Baryte Mine
188.1	Lunedale, East Hush, Close House	4490	385330	522820	Post Medieval - AD1541 to AD1899	Lead Mine
188.2	Lunedale, East Hush, Close House	4490	385810	523000	Post Medieval - AD1541 to AD1899	Lead Mine
189.1	Lunedale, Green Grain Mine	4495	388290	522970	Post Medieval - AD1541 to AD1899	Lead Mine
190.1	Lunedale, Green Fell Mine	4499	387620	525860	Post Medieval - AD1541 to AD1899	Lead Mine
191.1	Holwick, Millstone How Mine	4501	388410	525610	Post Medieval - AD1541 to AD1899	Lead Mine
192.1	Holwick, Crinkled How	4502	388940	525630	Post Medieval - AD1541 to AD1899	Lead Mine
193.1	Forest-in-Teesdale, High Hurst	4505	385290	526150	Post Medieval - AD1541 to AD1899	Lead Workings
194.1	Forest-in-Teesdale, White Force Mine	4519	385300	528100	Post Medieval - AD1541 to AD1899	Lead Mine
195.1	Holwick, Swinkey Mease Mine	4526	389000	525600	Post Medieval - AD1541 to AD1899	Lead Workings
196.1	Barningham Moor, High Band	4577	404680	507160	Post Medieval - AD1541 to AD1899	Lead Workings
197.1	Ettergill, Dirt Pit Level	4604	389050	529010	Post Medieval - AD1541 to AD1899	Lead Mine
198.1	Cowshill, Guinea Grove	4641	384820	542560	Post Medieval - AD1541 to AD1899	Lead Mine open cut
199.1	Killhope, Wellhope Trial Levels	4643	381030	541000	Post Medieval - AD1541 to AD1899	Lead Mine
200.1	Killhope, Wellheads	4646	382500	540370	Post Medieval - AD1541 to AD1899	Lead Mine Hush
201.1	Killhope, Kirkstead Level	4647	382010	540660	Post Medieval - AD1541 to AD1899	Lead Mine
202.1	Cowshill, Whitestonefield	4652	382910	541050	Post Medieval - AD1541 to AD1899	Lead Mine
202.2	Cowshill, Whitestonefield	4652	382950	541100	Post Medieval - AD1541 to AD1899	Lead Mine

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
203.1	Cowshill, Wear Lead Company	4653	380300	540900	Post Medieval - AD1541 to AD1899	Lead Mine
204.1	Bowman's Vein	4654	383300	541300	Post Medieval - AD1541 to AD1899	Lead Workings
205.1	Killhope, Low Hill	4673	380090	542970	Post Medieval - AD1541 to AD1899	Lead Workings
206.1	Cowshill, Random Shafts	4674	381650	542840	Medieval - AD1066 to AD1540	Lead Mining
207.1	Killhope, Cow Horse Hush and Mines	4676	382620	542290	Post Medieval - AD1541 to AD1899	Lead Workings
208.1	Killhope, Snodberry Vein	4677	383200	543000	Post Medieval - AD1541 to AD1899	Lead Mine
209.1	Cowshill, Puddingthorne Vein	4687	383680	383680	Post Medieval - AD1541 to AD1899	Lead Mining
210.1	Killhope, Killhope Head	4690	380060	543170	Post Medieval - AD1541 to AD1899	Lead Workings
211.1	Cowshill, High Puddingthorne	4693	383950	542680	Post Medieval - AD1541 to AD1899	Lead Workings
212.1	Killhope, Killhope Head 2	4694	380040	543300	Post Medieval - AD1541 to AD1899	Lead Workings
213.1	Killhope, Killhope Mines	4695	381590	543290	Post Medieval - AD1541 to AD1899	Lead Mines
214.1	Killhope, Blue Heaps	4700	382090	544150	Post Medieval - AD1541 to AD1899	Lead Workings
215.1	Cowshill, Midge Pits Vein	4708	385900	540850	Post Medieval - AD1541 to AD1899	Lead Mining
216.1	Cowshill, High Sedling Mine	4718	386650	540870	Post Medieval - AD1541 to AD1899	Lead Mine
217.1	St. John's Chapel, Middlehope Bank	4719	388340	540460	Post Medieval - AD1541 to AD1899	Lead Workings
218.1	St. John's Chapel, Yearncleugh Groove	4724	389200	541000	Post Medieval - AD1541 to AD1899	Lead Workings
219.1	St. John's Chapel, Middlehope Old Mine	4725	389110	540580	Post Medieval - AD1541 to AD1899	Lead Mine
220.1	St. John's Chapel Old Middlehope Sike	4726	389210	540050	Post Medieval - AD1541 to AD1899	Lead Workings
221.1	Westgate, Seeingsike Mine	4728	389710	540370	Post Medieval - AD1541 to AD1899	Lead Workings
222.1	Cowshill, Brackensike Vein	4771	385900	542150	Post Medieval - AD1541 to AD1899	Lead and Ironstone Mine
223.1	Cowshill, Burtree Pasture	4772	386000	541130	Post Medieval - AD1541 to AD1899	Lead and Fluorspar Mine
224.1	Cowshill, Burtree Pasture Vein	4776	386500	541900	Post Medieval - AD1541 to AD1899	Lead Workings
225.1	Westgate, Low Yearncleugh Groove	4778	388200	541100	Post Medieval - AD1541 to AD1899	Lead Workings
226.1	Westgate, High Yearncleugh Groove	4779	388860	541140	Post Medieval - AD1541 to AD1899	Lead Workings
227.1	Cowshill, Claypath Vein	4785	385260	542540	Post Medieval - AD1541 to AD1899	Lead Workings
228.1	St.John's Chapel, Middlehopehead Grove	4797	388000	542010	Post Medieval - AD1541 to AD1899	Lead Mine
229.1	Rookhope, Breckensike Level	4798	389070	543600	Post Medieval - AD1541 to AD1899	Lead Mine
230.1	Rookhope, Whimsey Cleugh	4799	389610	543240	Post Medieval - AD1541 to AD1899	Lead Workings
231.1	Rookhope, Frazer's Hushes	4804	388400	544550	Post Medieval - AD1541 to AD1899	Lead Mine, open cut
232.1	Rookhope, Greencleugh Vein Level	4805	387930	544330	Post Medieval - AD1541 to AD1899	Lead Mine
233.1	Rookhope, Grove Rake 2	4835	389600	544100	Post Medieval - AD1541 to AD1899	Lead and Fluorspar Mine
234.1	Rookhope, Rookhope Head Mine	4836	388590	544570	Modern - AD1900 to present	Lead and Fluorspar Mine
235.1	Rookhope, West Groverake Open Cut	4837	389100	544000	Post Medieval - AD1541 to AD1899	Lead and Ironstone Mine
236.1	Stainmore, Ay Gill Level	4859	390450	510090	Post Medieval - AD1541 to AD1899	Lead Mine
237.1	Cotherstone, Hunder Beck Mine	4927	391500	516400	Post Medieval - AD1541 to AD1899	Lead Mine
238.1	Beldon, Beldon Mine	5047	392870	549530	Post Medieval - AD1541 to AD1899	Lead Mine
239.1	Scargill, Scargill Low Moor Mine	5179	399830	511600	Post Medieval - AD1541 to AD1899	Lead Mine
240.1	Holwick, Carley Green Mine	5269	392630	524650	Post Medieval - AD1541 to AD1899	Lead Mine
241.1	Lunedale, How Top Mine	5273	390380	523200	Post Medieval - AD1541 to AD1899	Lead Mine
242.1	Lunedale, Toddy Gill Mine	5274	391180	522850	Post Medieval - AD1541 to AD1899	Lead Mine
243.1	Holwick, Easter Beck Mine	5292	391120	525910	Post Medieval - AD1541 to AD1899	Lead Mine

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
244.1	Holwick, Holwick Scar Veins	5309	390525	526775	Post Medieval - AD1541 to AD1899	Lead Mine Workings
245.1	Newbiggin, Stoney Gill Mine	5321	393310	526770	Post Medieval - AD1541 to AD1899	Lead Workings
246.1	Middleton-in-Teesdale, Deputation Level	5322	394720	526070	Post Medieval - AD1541 to AD1899	Lead and Barytes Mine
247.1	Holwick, Wybch Bridge Mine	5326	390530	527670	Post Medieval - AD1541 to AD1899	Lead Mine
248.1	Newbiggin, High Ravelin House Mine	5329	392270	527880	Post Medieval - AD1541 to AD1899	Lead Mine
249.1	Newbiggin, Mount Pleasant Level	5330	392030	527730	Post Medieval - AD1541 to AD1899	Lead Mine
250.1	Middleton-in-Teesdale, Howgill Sike Mine	5347	393910	527350	Post Medieval - AD1541 to AD1899	Lead Mine
251.1	Middleton-in-Teesdale, Aukside Level	5360	394640	527050	Post Medieval - AD1541 to AD1899	Lead Mine
252.1	Newbiggin, Red Grooves Mine	5384	392350	529080	Post Medieval - AD1541 to AD1899	Lead Mine
253.1	Newbiggin, Stable Edge Level	5385	392200	528120	Post Medieval - AD1541 to AD1899	Lead Mine Level
254.1	Middleton-in-Teesdale, Raine's Shaft	5386	393170	528680	Post Medieval - AD1541 to AD1899	Lead Mine
255.1	Middleton-in-Teesdale, Marlbeck Mine	5389	394990	528730	Post Medieval - AD1541 to AD1899	Lead Mine
256.1	Middleton-in-Teesdale, Low Skears Mine	5390	394730	527550	Post Medieval - AD1541 to AD1899	Lead Mine
257.1	Newbiggin, Hell Cleugh Mine	5404	391000	526930	Post Medieval - AD1541 to AD1899	Lead Mining
258.1	Bowlees, Mirk Holme Level	5435	390820	529280	Post Medieval - AD1541 to AD1899	Lead Mining
259.1	Newbiggin, Bleakley Green Mine	5440	391600	529970	Post Medieval - AD1541 to AD1899	Lead Mine
260.1	Newbiggin, Lord's Allotment Workings	5446	392590	529630	Post Medieval - AD1541 to AD1899	Lead Mine
261.1	Middleton-in-Teesdale, Coldberry Dog Level	5449	393880	529360	Post Medieval - AD1541 to AD1899	Lead Mine
262.1	Middleton-in-Teesdale, Hudeshope Head Mine	5451	394260	529580	Post Medieval - AD1541 to AD1899	Lead Mine Complex
263.1	Middleton-in-Teesdale, Pikestone Brow Mine	5458	394790	529460	Post Medieval - AD1541 to AD1899	Lead Mine
264.1	Mickleton, West Pasture Mine	5484	395260	522740	Post Medieval - AD1541 to AD1899	Lead Mine
265.1	Mickleton, West Pasture Mine 6	5485	395420	522570	Post Medieval - AD1541 to AD1899	Lead Mine
266.1	Lunedale, Ellerbeck Mine	5525	395460	523230	Post Medieval - AD1541 to AD1899	Lead Mine
267.1	Middleton-in-Teesdale, Snaisgill Mine	5599	395000	526800	Post Medieval - AD1541 to AD1899	Lead, Barytes and Iron Mine
268.1	Eggleston, Cowlake Bottoms	5625	398560	526010	Post Medieval - AD1541 to AD1899	Lead Mine
269.1	Eggleston, Hope Level	5648	398900	527950	Post Medieval - AD1541 to AD1899	Lead Mine
270.1	Eggleston, East Skears Mine	5650	398920	527220	Post Medieval - AD1541 to AD1899	Lead Mine
271.1	Middleton-in-Teesdale, Marlbeck Mine	5653	395450	528790	Post Medieval - AD1541 to AD1899	Lead Mine
272.1	Middleton-in-Teesdale, Marlbeck Mine	5654	395380	528880	Post Medieval - AD1541 to AD1899	Lead Mine Shaft
273.1	Middleton-in-Teesdale, High Skears Mine	5655	395020	528250	Post Medieval - AD1541 to AD1899	Lead Mine
274.1	Barningham Moor, Hope Moor Workings	5723	403400	507000	Post Medieval - AD1541 to AD1899	Lead Mining
275.1	Barningham Moor, Hope Moor Workings 2	5724	403600	506950	Post Medieval - AD1541 to AD1899	Lead Mining
276.1	Barningham Moor, Hope Moor Workings, The Stang	5725	403600	507400	Post Medieval - AD1541 to AD1899	Lead Mining
277.1	Barningham Moor, Hush Head Workings	5726	404200	507400	Post Medieval - AD1541 to AD1899	Lead Mining
278.1	Stanhope, New Level Hill	5899	383574	542143	Post Medieval - AD1541 to AD1899	Lead Mining
279.1	Killhope, Killhope Mine	5917	382624	543125	Post Medieval - AD1541 to AD1899	Lead Mine
280.1	Bowes Moor, Ay Gill	6358	390400	511100	Post Medieval - AD1541 to AD1899	Lead Mine
281.1	Holwick, Crossthwaite Common	6511	392230	524950	Roman - AD70 to C5	Lead Mines
282.1	Holwick, Crossthwaite Common 2	6514	392230	524950	Medieval - AD1066 to AD1540	Lead Mines
283.1	Rookhope, Boltsburn Mine	6862	393870	542870	Post Medieval - AD1541 to AD1899	Lead Mine and Mill
284.1	Killhope	7723	382627	543036	Post Medieval - AD1541 to AD1899	Lead Mine Channel

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
285.1	Killhope 2	7724	382605	543049	Post Medieval - AD1541 to AD1899	Lead Mine Culvert
286.1	Killhope 3	7725	382613	542910	Post Medieval - AD1541 to AD1899	Lead Mine Channel
287.1	Killhope 4	7726	382618	542978	Post Medieval - AD1541 to AD1899	Lead Mine Channel
288.1	Killhope 5	7727	382590	542935	Post Medieval - AD1541 to AD1899	Lead Mine Channel
289.1	Killhope 6	7728	382510	542863	Post Medieval - AD1541 to AD1899	Lead Mine Channel
290.1	Killhope 7	7729	382439	542885	Post Medieval - AD1541 to AD1899	Lead Mine Channel
290.2	Killhope 7	7729	382447	542991	Post Medieval - AD1541 to AD1899	Lead Mine Channel
290.3	Killhope 7	7729	382516	542800	Post Medieval - AD1541 to AD1899	Lead Mine Channel
291.1	Killhope 8	7730	382480	542895	Post Medieval - AD1541 to AD1899	Lead Mine Channel
292.1	Killhope 9	7731	382190	543052	Post Medieval - AD1541 to AD1899	Lead Mine Channel
292.2	Killhope 9	7731	382447	542945	Post Medieval - AD1541 to AD1899	Lead Mine Channel
292.3	Killhope 9	7731	382454	542938	Post Medieval - AD1541 to AD1899	Lead Mine Channel
292.4	Killhope 9	7731	382510	542963	Post Medieval - AD1541 to AD1899	Lead Mine Channel
293.1	Killhope 10	7732	382170	543092	Post Medieval - AD1541 to AD1899	Lead Mine Dam
294.1	Killhope 11	7733	382510	542988	Post Medieval - AD1541 to AD1899	Lead Mine Dam
295.1	Killhope 12	7734	382554	542892	Post Medieval - AD1541 to AD1899	Lead Mine Dam
296.1	Killhope 13	7735	382265	543038	Post Medieval - AD1541 to AD1899	Lead Mine Dam
297.1	Killhope 14	7736	382259	543068	Post Medieval - AD1541 to AD1899	Lead Mine Shaft
298.1	Killhope 15	7739	382362	543197	Post Medieval - AD1541 to AD1899	Lead Mine Channel
299.1	Killhope 16	7740	382387	543225	Post Medieval - AD1541 to AD1899	Lead Mine Channel
299.2	Killhope 16	7740	382414	543194	Post Medieval - AD1541 to AD1899	Lead Mine Channel
299.3	Killhope 16	7740	382468	543116	Post Medieval - AD1541 to AD1899	Lead Mine Channel
300.1	Killhope 17	7741	382382	543181	Post Medieval - AD1541 to AD1899	Lead Mine Upcast(?)
301.1	Killhope 18	7742	382382	382382	Post Medieval - AD1541 to AD1899	Lead Mine Workings
302.1	Killhope 19	7748	382457	543062	Post Medieval - AD1541 to AD1899	Lead Mine Other Structure
303.1	Killhope 20	7750	382477	543040	Post Medieval - AD1541 to AD1899	Lead Mine Channel
304.1	Killhope 21	7751	382490	543051	Post Medieval - AD1541 to AD1899	Lead Mine Channel
305.1	Killhope 22	7752	382477	543060	Post Medieval - AD1541 to AD1899	Lead Mine Channel
305.2	Killhope 22	7752	382613	542941	Post Medieval - AD1541 to AD1899	Lead Mine Channel
306.1	Killhope 23	7753	382506	543022	Post Medieval - AD1541 to AD1899	Lead Mine Channel
307.1	Killhope 24	7754	382505	543086	Post Medieval - AD1541 to AD1899	Lead Mine Channel
307.2	Killhope 24	7754	382560	543075	Post Medieval - AD1541 to AD1899	Lead Mine Channel
307.3	Killhope 24	7754	382592	542996	Post Medieval - AD1541 to AD1899	Lead Mine Channel
308.1	Killhope 25	7755	382495	543038	Post Medieval - AD1541 to AD1899	Lead Mine Channel
309.1	Killhope 26	7756	382461	543075	Post Medieval - AD1541 to AD1899	Lead Mine Channel
310.1	Killhope 27	7759	382293	543070	Post Medieval - AD1541 to AD1899	Lead Mine Shaft
311.1	Killhope 28	7760	382260	543100	Post Medieval - AD1541 to AD1899	Lead Mine Shaft
312.1	Killhope 29	7761	382265	543108	Post Medieval - AD1541 to AD1899	Lead Mine Shaft
313.1	Killhope 30	7762	382356	543222	Post Medieval - AD1541 to AD1899	Lead Mine Hush
314.1	Killhope 31	7763	382461	543177	Post Medieval - AD1541 to AD1899	Lead Mine Channel
315.1	Killhope 32	7764	382411	543113	Post Medieval - AD1541 to AD1899	Lead Mine Platform

Lead Mines (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
316.1	Killhope 33	7766	382414	543114	Post Medieval - AD1541 to AD1899	Lead Mine Gully
317.1	Killhope 34	7767	382438	543091	Post Medieval - AD1541 to AD1899	Lead Mine Shaft(?)
318.1	Killhope 35	7768	382610	543040	Post Medieval - AD1541 to AD1899	Lead Mine Channel
319.1	Killhope 36	7833	482600	542900	Post Medieval - AD1541 to AD1899	Lead Mine
320.1	Scargill, Ellerbeck Mine	7960	399200	510300	Post Medieval - AD1541 to AD1899	Lead Mine Trial Workings
321.1	Scargill, High Moor	7961	399000	510000	Post Medieval - AD1541 to AD1899	Lead Mine Trial Workings
322.1	Scargill, Spanham Mine	7962	409900	509900	Undetermined	Lead Mine
323.1	Rookhope, Boltsburn Mine	8221	393670	542759	Post Medieval - AD1541 to AD1899	Lead Mine
324.1	Stanhope, Groove Rake Mine	8466	399510	540350	Post Medieval - AD1541 to AD1899	Lead Mine
324.2	Stanhope, Groove Rake Mine	8466	399800	540200	Post Medieval - AD1541 to AD1899	Lead Mine
325.1	Stanhope, Hope Level	8470	399067	537360	Post Medieval - AD1541 to AD1899	Lead Mine
326.1	Frosterly, Old Level	8579	402850	537210	Post Medieval - AD1541 to AD1899	Lead Mine
327.1	Frosterly, Mill Eale Old Level	8580	402750	536580	Post Medieval - AD1541 to AD1899	Lead Mine
328.1	Stanhope, Westernhope Mine	9943	391973	534500	Post Medieval - AD1541 to AD1899	Lead Mine
329.1	Stanhope, Westernhope Mine 2	9947	393035	534723	Post Medieval - AD1541 to AD1899	Lead Mine
330.1	Westgate, Swinhope Mine(s?)	9948	390090	534690	Post Medieval - AD1541 to AD1899	Lead Mine
331.1	Eastgate, Ludwell Mine	9969	394532	537419	Post Medieval - AD1541 to AD1899	Lead Mine
332.1	Eastgate, Ludwell Mine 2	9970	394841	537626	Post Medieval - AD1541 to AD1899	Lead Mine
333.1	Westgate, Scotours Mine	9992	??	??	Post Medieval - AD1541 to AD1899	Lead Mine (Co-ordinates not given on PRN)

LEAD SMELTING

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Eggleston, Druvy Burn	29	397950	526440	Medieval - AD1066 to AD1540	Lead slag heap
2.1	Castleside, Healeyfield	794	407800	548400	Post Medieval - AD1541 to AD1899	Lead smelting mill
3.1	Eggleston, High, Middle and Low mils	821	399500	525000	Post Medieval - AD1541 to AD1899	Lead smelting mills
4.1	Langdon Beck, Grasshill	834	382300	535300	Undetermined	Lead smelting site
5.1	Eggleston, Druvy Burn	3431	398400	526400	Medieval - AD1066 to AD1540	Lead smelting site
6.1	Wolsingham, Park Bale	3558	403995	544526	Medieval - AD1066 to AD1540	Lead smelting site
7.1	Wolsingham, Park Bale 2	3559	404070	544370	Medieval - AD1066 to AD1540	Lead smelting site
8.1	Wolsingham, Park Bale 3	3560	404038	544393	Medieval - AD1066 to AD1540	Lead smelting site
9.1	Stanhope Common, Crawleyside	3561	399303	541100	Medieval - AD1066 to AD1540	Lead smelting site
10.1	Stanhope Common, Crawleyside	3562	399293	541088	Medieval - AD1066 to AD1540	Lead smelting site (?)
11.1	Stanhope Common, Crawleyside	3563	399187	541208	Medieval - AD1066 to AD1540	Lead smelting site (?)
12.1	Stanhope Common, Crawleyside	3564	399175	541236	Medieval - AD1066 to AD1540	Lead smelting site (?)
13.1	Stanhope Common, Crawleyside	3565	399023	541550	Medieval - AD1066 to AD1540	Lead smelting site (?)
14.1	Stanhope Common, Crawleyside	3566	399032	541693	Medieval - AD1066 to AD1540	Lead smelting site (?)
15.1	Stanhope Common, Crawley Top	3567	399351	540452	Medieval - AD1066 to AD1540	Lead smelting site (?)
16.1	Stanhope Common, Black Burn	3574	400672	540092	Medieval - AD1066 to AD1540	Lead smelting site and hushes

LEAD SMELTING (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
16.2	Stanhope Common, Black Burn	3574	400676	540130	Medieval - AD1066 to AD1540	Lead smelting site and hushes
16.3	Stanhope Common, Black Burn	3574	400677	540100	Medieval - AD1066 to AD1540	Lead smelting site and hushes
16.4	Stanhope Common, Black Burn	3574	401067	540262	Medieval - AD1066 to AD1540	Lead smelting site and hushes
17.1	Edmundbyers, Matt's Sheepfold	3576	400286	551136	Medieval - AD1066 to AD1540	Lead smelting site
18.1	Edmundbyers, Harry's Allotment	3579	400447	549595	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
19.1	Edmunbyers, Swandale	3580	399949	549411	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
20.1	Edmunbyers, Swandale	3581	400521	549213	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
21.1	Edmundbyers, College Edge 1	3582	399840	549002	Medieval - AD1066 to AD1540	Lead smelting site, possible bale,dam and buddle
22.1	Edmundbyers, College Edge 2	3583	399840	549002	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
23.1	Edmundbyers, nr College Syke	3608	399575	548813	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
24.1	Edmundbyers, nr College Syke	3609	399626	548724	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
24.2	Edmundbyers, nr College Syke	3609	399633	548718	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
24.3	Edmundbyers, nr College Syke	3609	399637	548676	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
24.4	Edmundbyers, nr College Syke	3609	399644	548717	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
25.1	Muggleswick, The Middles	3610	399692	548358	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
26.1	Muggleswick, The Middles 2	3611	399417	547971	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
27.1	Muggleswick, The Middles 3	3612	399306	547591	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
28.1	Muggleswick, The Middles 4	3613	399274	547540	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
29.1	Muggleswick, The Middles 5	3614	399259	547995	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
30.1	Muggleswick, Feldon Burn	3615	399767	547390	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
31.1	Muggleswick, Feldon Burn	3616	399763	547375	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
32.1	Muggleswick, Eudon Burn	3622	398606	545836	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
33.1	Muggleswick, Harehope	3623	400985	548988	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
33.2	Muggleswick, Harehope	3623	400998	548980	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
34.1	Muggleswick, Feldon	3624	400369	548488	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
35.1	Muggleswick, Feldon 2	3625	400318	548438	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
36.1	Muggleswick, Feldon 3	3631	400234	548334	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
37.1	Muggleswick, Feldon 4	3632	400196	548276	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
38.1	Muggleswick, Hisehope Burn	3633	403702	547221	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
39.1	Muggleswick, Hisehope Burn 2	3639	403709	547273	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
40.1	Muggleswick, Hisehope Burn 3	3640	403736	547282	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
41.1	Muggleswick, Hisehope Burn 4	3641	403710	547313	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
42.1	Muggleswick, Goldhill	3642	404814	547320	Medieval - AD1066 to AD1540	Lead smelting site, possible bale
43.1	Rookhope	3827	391510	542760	Post Medieval - AD1541 to AD1899	Lead working site
44.1	Muggleswick, Feldon	3870	399940	548510	Post Medieval - AD1541 to AD1899	Lead Mill
45.1	Hunstanworth, Derwent Lead Mines	3888	395520	547890	Post Medieval - AD1541 to AD1899	Lead mining and smelting site
46.1	High Foce, East Force Garth	5132	387830	528520	Roman - AD70 to C5	Lead smelting site
47.1	Bollihope, Bollihope Common	5680	397700	535300	Early Medieval - C5 to AD1066	Lead smelting site
48.1	Eastgqte, Bank	9736	??	??	Medieval - AD1066 to AD1540	Lead smelting site, possible bale (Co-ordinates not given on PRN)

LEADMILLS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Cows Hill	226	385500	540500	Medieval - AD1066 to AD1540	Lead Crushing Mill - Burtreeford Mill
2.1	Killhope	848	382700	542900	Post Medieval - AD1541 to AD1899	Lead Crushing Mill - Killhope Wheel
3.1	Edmundbyers, College enclosure	3582	399840	549002	Medieval - AD1066 to AD1540	Lead Smelting Bale, dam and buddle (?)
4.1	Muggleswick, Feldon	3870	399940	548510	Post Medieval - AD1541 to AD1899	Lead smelting mill complex
5.1	Harwood in Teesdale, Near Hole Sike	3984	380230	531170	Post Medieval - AD1541 to AD1899	Lead Mine Level
6.1	Harwood in Teesdale, Near Willyhole	4012	381250	533390	Post Medieval - AD1541 to AD1899	Lead Mine Level
7.1	Langdon Beck	4141	385300	531200	Post Medieval - AD1541 to AD1899	Lead smelting mill water course
8.1	Ireshopeburn	4256	386840	538880	Post Medieval - AD1541 to AD1899	Lead Crushing Mill
9.1	Cows Hill	4701	385500	540500	Post Medieval - AD1541 to AD1899	Lead Crushing Mill - Burtreeford Mill - NB PRN226!
10.1	Middleton in Teesdale	5451	394260	529580	Post Medieval - AD1541 to AD1899	Lead Mine Complex - Hudeshope level

MEDIEVAL ROAD BRIDGES

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Piercebridge, bridge	11302	421080	515559	Medieval - AD1066 to AD1540	Road Bridge over the river Tees
2.1	Sunderland, bridge	11998	426514	537769	Medieval - AD1066 to AD1540	Road Bridge over the river Wear
3.1	Sunderland, bridge	11998	426520	537766	Medieval - AD1066 to AD1540	Road Bridge over the river Wear
4.1	Aldin Grange, Bridge	12490	424955	542926	Medieval - AD1066 to AD1540	Road Bridge over the river ????
5.1	Hurworth, Croft Bridge	11284	428974	509835	Medieval - AD1066 to AD1540	Road Bridge over the river Tees
6.1	Hurworth, Croft Bridge	11303	428963	509831	Medieval - AD1066 to AD1540	Road Bridge over the river Tees
7.1	Sunderland, bridge	12405	426520	537766	Medieval - AD1066 to AD1540	Road Bridge over the river Wear
8.1	Hunderthwaite, Balder Bridge	12869	400914	520031	Medieval - AD1066 to AD1540	Road Bridge over the river Balder(?)
9.1	Ronalkirk, Egglesone Bridge	13795	399674	523228	Medieval - AD1066 to AD1540	Road Bridge over the river Tees
10.1	Bishop Auckland, Newton Cap Bridge	14537	420512	530258	Medieval - AD1066 to AD1540	Road Bridge over the river (?)
11.1	South Church, Deanery Brdge	14541	421655	528338	Medieval - AD1066 to AD1540	Road Bridge over the river (?)

MEDIEVAL ROADS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Thrislington (to Ferryhill)	1105	429740	533190	Medieval - AD1066 to AD1540	Medieval paved pathway
1.2	Thrislington (to Ferryhill)	1105	430170	533400	Medieval - AD1066 to AD1540	Medieval paved pathway
2.1	Cockfield, Raby	1718	412500	523400	Medieval - AD1066 to AD1540	Site of Road
2.2	Cockfield, Raby	1718	413250	522050	Medieval - AD1066 to AD1540	Site of Road
3.1	Egglestone Abbey	5704	406250	515100	Medieval - AD1066 to AD1540	Possible Hollow Way
4.1	Westgate, Weardale	8739	390571	538189	Medieval - AD1066 to AD1540	Medieval Road
4.2	Westgate, Weardale	8739	390634	538226	Medieval - AD1066 to AD1540	Medieval Road
4.3	Westgate, Weardale	8739	390697	538238	Medieval - AD1066 to AD1540	Medieval Road
4.4	Westgate (Castle?), Weardale	8739	390793	538240	Medieval - AD1066 to AD1540	Medieval Road

PACKHORSE BRIDGES

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Brafferton, Ketton Lane	11349	430301	519321	Undetermined - (late C17 early C18?)	Packhorse Bridge - over ??
2.1	Cornsay, Low Mill	11637	414120	544383	Undetermined - (early C18?)	Packhorse Bridge - over Pan Burn
3.1	Headlam, The Green	12908	417910	518934	Post Medieval - AD1541 to AD1899	Packhorse Bridge - over ??
4.1	Newbiggin, nr Fellowship Farm	12953	391459	527833	Undetermined - C18(?) with C19(?) parapets.	Packhorse Bridge - over Newbiggin Beck
5.1	Egglestone Abbey, Abbey Lane	13737	406236	515217	Undetermined - C17(?)	Packhorse Bridge - over Thorsgill Beck
6.1	Bowes, nr Nabb House	13775	400149	515521	Post Medieval - AD1541 to AD1899	Packhorse Bridge (?) - over ??

POST MEDIEVAL MILESTONES

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Easington	818	441200	542000	Post Medieval - AD1541 to AD1899	Milestone, Triangular Cast Iron, headings to Sunderland and Seaham
1.2	Easington	818	441510	541610	Post Medieval - AD1541 to AD1899	Milestone, Triangular Cast Iron, headings to Sunderland and Seaham
2.1	Marwood, Darlington Road	3724	406180	517020	Post Medieval - AD1541 to AD1899	Milestone, painted white with incised black script, C18(?)
3.1	South of Redwing on B6277	3991	384450	531860	Post Medieval - AD1541 to AD1899	Milestone, headings to Alston and Middleton, c1830(?)
4.1	Ashgill, on B6277	4039	382280	534080	Post Medieval - AD1541 to AD1899	Milestone
5.1	Yad Moss	4397	379940	535290	Post Medieval - AD1541 to AD1899	Milestone, with incised black script
6.1	Cleve Head	4434	383790	520130	Post Medieval - AD1541 to AD1899	Milestone
7.1	Lunehead	4439	385290	520430	Post Medieval - AD1541 to AD1899	Milestone
8.1	Lunehead (3)	4478	385290	520450	Post Medieval - AD1541 to AD1899	Milestone, heading to Brough
9.1	Grains 'o th' Beck	4481	386790	520800	Post Medieval - AD1541 to AD1899	Milepost
10.1	Ettersgill Bridge	4554	389400	389400	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Alston and Middleton
11.1	Hanging Shaw	4598	386670	529840	Post Medieval - AD1541 to AD1899	Milestone, headings to Alston and Middleton, c1830(?)
12.1	Ivy Hall, on A66	5151	398310	513440	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings Bowes and Brough
13.1	Burn Bridge, on B6282	5569	398770	524150	Post Medieval - AD1541 to AD1899	Milestone, headings to Edge and MIDN, 1792(?)
14.1	Laneside	5580	396150	525820	Post Medieval - AD1541 to AD1899	Milestone, headings to Edge and MIDN
15.1	Foggerthwaite	5581	397560	525000	Post Medieval - AD1541 to AD1899	Milestone, headings to Edge and MIDN, 1792(?)
16.1	Frosterly	8640	402540	539540	Post Medieval - AD1541 to AD1899	Milepost, late C19(?)
17.1	Wearhead, Historic Settlement Patterns	8876	385888	539380	Post Medieval - AD1541 to AD1899	Milestone, outside Onich House
18.1	Great Burdon	11433	431814	516433	Post Medieval - AD1541 to AD1899	Milestone, late C18 / early C19
18.2	Great Burdon	11433	431814	516433	Post Medieval - AD1541 to AD1899	Milepost, cast iron, headings to stockton and Darlington, C19
19.1	Sately, on B6296	11612	411563	542928	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, for Wolsingham to Gateshead Turnpike, 1793(?)

POST MEDIEVAL MILESTONES (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
20.1	Lanchester, on A68	11624	409396	544061	Post Medieval - AD1541 to AD1899	Milestone, for West Auckland to Corbridge Turnpike, late C18
21.1	Healyfield, on A68	11655	408195	548430	Post Medieval - AD1541 to AD1899	Milestone, for West Auckland to Corbridge Turnpike, late C18
22.1	Lanchester, on A68	11662	409167	545596	Post Medieval - AD1541 to AD1899	Milestone, for West Auckland to Corbridge Turnpike, late C18
23.1	Satley, on B65296	11683	412582	544274	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, for Wolsingham to Gateshead Turnpike, 1793(?)
24.1	Lanchester, on B6296	11862	414836	546392	Post Medieval - AD1541 to AD1899	Milestone, with incised script, for Wolsingham to Gateshead Turnpike, 1793(?)
25.1	Lanchester, on B6296	11863	413633	545462	Post Medieval - AD1541 to AD1899	Milestone, with incised script, for Wolsingham to Gateshead Turnpike, 1793(?)
26.1	Satley, on A68	11871	409534	542484	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, for West Auckland to Corbridge Turnpike, late C18
27.1	Healyfield, on A68	11863	408900	547163	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, for West Auckland to Corbridge Turnpike, late C18
28.1	Satley, on A68	11889	409836	540957	Post Medieval - AD1541 to AD1899	Milestone, with incised script, for West Auckland to Corbridge Turnpike, late C18
29.1	Healyfield, on A68	11892	407711	549689	Post Medieval - AD1541 to AD1899	Milestone, with incised script, for West Auckland to Corbridge Turnpike, late C18
30.1	Neville's Cross	12278	426149	541950	Post Medieval - AD1541 to AD1899	Milestone, heading to Willin/ton, C18(?)
31.1	Easington, The Green	12621	441601	543432	Post Medieval - AD1541 to AD1899	Milestone, headings to Durham and Houghton-Le-Spring, early C19(?)
32.1	Wad Hazel Sike, on B6277	12827	379951	535291	Post Medieval - AD1541 to AD1899	Milestone, headings to Alston and Middleton, c1830(?)
33.1	B6282 junction with Billy Lane	12840	404399	524298	Post Medieval - AD1541 to AD1899	Milestone, headings to Edge and MIDN, early C19(?)
34.1	Winston, junction A67 and Tarn Lane	12882	412500	516388	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Barnard Castle and D'ton, C19(?)
35.1	Bowes on A67 at New House	12897	400630	514367	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Durham and Bowes, C19(?)
36.1	Headlam on B6279	12905	418969	519630	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Darlington and Staindrop, C19(?)
37.1	Whorlton on A67 nr Arlaw Banks	12920	409375	516592	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Barnard Castle and D'ton, C19(?)
38.1	Gainford on A67 nr Greystone Hall	12928	418513	516442	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Barnard Castle and D'ton, C19(?)
39.1	Gainford on B6274 nr Alwent Farm	12932	413860	519349	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Richmond and Staindrop, C19(?)
40.1	Cleatlam on A688, nr Barford Farm	12949	409922	518876	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Bowes and Durham, C19(?)
41.1	New Biggin on B6277, nr Brokersgill	12994	391976	527069	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Alston and Middleton, c1830
42.1	Eggleston on B6282, nr Burn Bridge	13027	398757	524118	Post Medieval - AD1541 to AD1899	Milestone, headings to Edge and MIDN

POST MEDIEVAL MILESTONES (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
43.1	Eggleston on B6282, nr Stobgreen	13028	400174	523548	Post Medieval - AD1541 to AD1899	Milestone, headings to Edge and MIDN
44.1	On B6277 nr Crookburn Sike	13035	378498	535283	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Alston and Middleton
45.1	Hanging Shaw on B6277	13037	389105	528775	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Alston and Middleton, c1830
46.1	Wycliffe with Thorpe on A66 nr Grange Farm	13055	409333	512738	Post Medieval - AD1541 to AD1899	Milestone, headings for Catterick Bridge and Greata Bridge, C18
47.1	Rokeby on A66 nr Tutta Beck Farm	13070	406517	513764	Post Medieval - AD1541 to AD1899	Milestone, headings for Greata Bridge and Bowes, C18
48.1	Rokeby on A66 nr junction with B6277	13071	404904	513824	Post Medieval - AD1541 to AD1899	Milestone, headings for Greata Bridge and Bowes, C18
49.1	Boldron on A67	13086	402184	514847	Post Medieval - AD1541 to AD1899	Milestone, headings for Bowes and Durham, C18(?)
50.1	Stainton Grove on A688	13138	407013	517974	Post Medieval - AD1541 to AD1899	Milestone, headings for Durham and Bowes, late C18
51.1	Wackerfield on B6279 nr Spinkford Bridge	13141	414699	521192	Post Medieval - AD1541 to AD1899	Milestone, headings for Darlington and Staindrop, mid
52.1	Staindrop, North of 34 South Green	13154	412563	520544	Post Medieval - AD1541 to AD1899	Milestone, headings for Bowes and Durham, C18
53.1	Raby with Keverstone on A688	13210	413224	521496	Post Medieval - AD1541 to AD1899	Milestone, headings for Bowes and Durham, late C18(?)
54.1	New Moor Lodge on A688	13258	416391	524378	Post Medieval - AD1541 to AD1899	Milestone, heading for Durham, late C18(?)
55.1	White House on B6282	13261	403035	523617	Post Medieval - AD1541 to AD1899	Milestone, headins for Edge and MIDN, early C19(?)
56.1	Follyhead on B6282	13275	401570	523105	Post Medieval - AD1541 to AD1899	Milestone, headins for Edge and MIDN, early C19(?)
57.1	Barnard Castle on Darlington Road	13278	406182	517044	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Barnard Castle and D'ton C18(?)
58.1	Keverstone Grange on A688	13287	414158	522605	Post Medieval - AD1541 to AD1899	Milestone, with headings for Durham and Bowes, late C18(?)
59.1	Westwick on Darlingto Road	13294	407738	516738	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Barnard Castle and D'ton C19
60.1	Winston, junction A67 and B6247	13319	414064	516573	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Richmond and Staindrop C19
61.1	Castle lodges on A688 nr Streatlam	13414	408396	518722	Post Medieval - AD1541 to AD1899	Milestone, with headings for Bowes and Durham, late C18
62.1	Barnard Castle nr Bridgegate	13444	404840	516310	Post Medieval - AD1541 to AD1899	Milestone, with headings for Bowes and Durham, late C18
63.1	on B6282 E of track to Stanhope Gate	13529	396130	525500	Post Medieval - AD1541 to AD1899	Milestone, with headings to Edge and MIDN, mid C19(?)
64.1	Ettergill Bridge on B6277	13543	389390	528407	Post Medieval - AD1541 to AD1899	Milestone, with headings for Alston and Middleton, c1830
65.1	Barnard Castle on Bede Road	13699	405692	517028	Post Medieval - AD1541 to AD1899	Milestone, with heading for Bowes and Durham, late C18
66.1	Wackersfield on A688 S of Sun Inn	13715	415420	523124	Post Medieval - AD1541 to AD1899	Milestone, with headings fro Durham and Bowes, late C18
67.1	Westholme Hall on B6274	13754	414039	517938	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Richmond and Staindrop mid C19
68.1	Junction of B6274 with Pudding Lane	13860	415076	515455	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Staindrop and Richmond C19(?)
69.1	nr junction of B6282 and Heather Lea	13881	397532	525002	Post Medieval - AD1541 to AD1899	Milestone, with headings for Edge and MIDN, early C19(?)
70.1	On B6277 nr Trough Syke	13888	382272	534072	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Alston and Middleton 1830(?)
71.1	Whorlton on A67 nr Whorley Hill Farm	13959	411058	516547	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Barnard Castle and D'ton, C19

POST MEDIEVAL MILESTONES (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
72.1	Bowes on A66 nr Ivy Hall	13984	398260	513411	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Bowes and Brough, early C19
73.1	S of Redwing Plantation on B6277	13993	384452	531877	Post Medieval - AD1541 to AD1899	Milestone, with incised black script, headings to Alston and Middleton, c1830
74.1	Bishop Auckland on Castle Drive	14071	422200	531000	Post Medieval - AD1541 to AD1899	Milestone, with heading '1 mile to castle', C18
75.1	Witton-le-Wear on A68	14114	413974	532202	Post Medieval - AD1541 to AD1899	Milestone, with headings for West Auckland and Corbridge, late C18
76.1	Wolsingham on A68 nr Park Wall Farm	14335	413031	537831	Post Medieval - AD1541 to AD1899	Milestone, with headings for West Auckland and Corbridge, late C18
77.1	Wolsingham High Street	14363	407300	537237	Post Medieval - AD1541 to AD1899	Milestone, with headings for Weardale, Durham and Stanhope, mid C19

POST MEDIEVAL ROAD BRIDGES

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Teesdale, Newbiggin, Watson's Bridge	9928	390992	530222	Post Medieval - AD 1541 to AD 1899	Road Bridge - over Flushimere Beck
2.1	Wear Valley, Stanhope, Land's Bridge	9959	391268	537806	Post Medieval - AD 1541 to AD 1899	Road Bridge - over ??
3.1	Wear Valley, Stanhope, Westernhope Bridge	9966	393491	537811	Post Medieval - AD 1541 to AD 1899	Road Bridge - over Westernhope Burn
4.1	Wear Valley, Stanhope, Barras Dale	9967	391988	537617	Post Medieval - AD 1541 to AD 1899	Sheepfold ???!!!
5.1	Wear Valley, Stanhope,Westgate, Haswick's Bridge	9983	390909	538030	Post Medieval - AD 1541 to AD 1899	Road Bridge - over River Wear
6.1	Wear Valley, Stanhope,Westgate, Westgate Bridge	9984	390717	538047	Post Medieval - AD 1541 to AD 1899	Road Bridge - over Middlehope Burn
7.1	High Urpeth, Upper Forge Bridge	11060	423500	554219	Post Medieval - AD 1541 to AD 1899	Road Bridge - over Urpeth Burn
8.1	Piercebridge, Carlbury Bridge	11494	421185	515897	Post Medieval - AD 1541 to AD 1899	Road Bridge - over ??
9.1	West Rainton, Mark's Lane	12036	431613	547611	Post Medieval - AD 1541 to AD 1899	Road Bridge - over railway
10.1	Brancepeth, Brancepeth Bridge	12059	422159	537728	Post Medieval - AD 1541 to AD 1899	Road Bridge - over Stockley Burn
11.1	Croxdale and Hett, The Avenue	12191	427168	537908	Post Medieval - AD 1541 to AD 1899	Road Bridge - over Croxdale Beck
12.1	West Rainton, Station Road	12255	431390	546608	Post Medieval - AD 1541 to AD 1899	Road Bridge - over railway
13.1	Shincliffe, Shincliffe Road, Shincliffe Bridge	12486	428742	541046	Post Medieval - AD 1541 to AD 1899	Road Bridge - over ??
14.1	City of Durham, Belmont, Pittington Lane	12491	431080	543975	Post Medieval - AD 1541 to AD 1899	Road Bridge - over Broomside railway cutting
15.1	Westwick, Egglestone Abbey, Abbey Bridge	13762	406616	514939	Post Medieval - AD 1541 to AD 1899	Road Bridge - over River Tees
16.1	Winston, Winston Bridge	13982	414257	516268	Post Medieval - AD 1541 to AD 1899	Road Bridge - over River Tees
17.1	Darlington, Chestnut Street	11414	429193	515061	Post Medieval - AD 1541 to AD 1899	Road Bridge - over the river Skerne
18.1	Darlington, Russel Street	11472	429177	514812	Post Medieval - AD 1541 to AD 1899	Road Bridge - over the river Skerne
19.1	Ebchester, Ebchester Bridge	11841	410033	555534	Post Medieval - AD 1541 to AD 1899	Road Bridge - over former railway
20.1	Bradbury	12705	433031	528398	Post Medieval - AD 1541 to AD 1899	Road Bridge - over the river Derwent
21.1	Baldersdale, nr West New Houses	12849	394580	519184	Post Medieval - AD1541 to AD1899	Road Bridge - over ??
22.1	Lunedale, Hargill Bridge	12857	388512	521649	Post Medieval - AD1541 to AD1899	Road Bridge - over Hargill Beck
23.1	Lunedale, Grains o' th' Beck Bridge	12858	386776	520757	Post Medieval - AD1541 to AD1899	Road Bridge - over the River Lune
24.1	Bowes, nr East Mellwaters	12895	396774	512857	Post Medieval - AD1541 to AD1899	Road Bridge - over ??
25.1	Starforth, Deepdale Bridge	13040	404567	516652	Post Medieval - AD1541 to AD1899	Road Bridge - over ??
26.1	Barnard Castle, Barnard Castle Bridge	13043	404801	516388	Post Medieval - AD1541 to AD1899	Road Bridge - over River Tees

POST MEDIEVAL ROAD BRIDGES (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
27.1	Winston, Winston Bridge	13143	414258	516270	Post Medieval - AD1541 to AD1899	Road Bridge - over River Tees
28.1	Bowes, Rutherford Bridge	13218	403484	512173	Post Medieval - AD1541 to AD1899	Road Bridge - over River Greta
29.1	Gilmonby, Gilmonby Bridge	13332	399573	513214	Post Medieval - AD1541 to AD1899	Road Bridge - over River Greta
30.1	Middleton-in-Teesdale, Middleton Bridge	13335	394660	525254	Post Medieval - AD1541 to AD1899	Road Bridge - over River Tees
31.1	Westwick, Egglestone Abbey, Abbey Bridge	13358	406616	514939	Post Medieval - AD1541 to AD1899	Road Bridge - over River Tees
32.1	Romaldkirk, Beer Beck Low Bridge	13417	399466	522264	Post Medieval - AD1541 to AD1899	Road Bridge - over Beer Beck(?)
33.1	Lunedale, Far Beck Bridge	13736	386639	520661	Post Medieval - AD1541 to AD1899	Road Bridge - over Lune Head Beck(?)
34.1	Laithkirk, Lune Bridge	13791	395904	524041	Post Medieval - AD1541 to AD1899	Road Bridge - over the River Lune
35.1	Startforth, Abbey Lane(?)	13878	406238	515224	Post Medieval - AD1541 to AD1899	Road Bridge - over the Thorsgill
36.1	Whorlton, Whorlton Suspension Bridge	13897	410666	514563	Post Medieval - AD1541 to AD1899	Road Bridge - over River Tees
37.1	Lartington, North Gill Bridge	13978	399621	517542	Post Medieval - AD1541 to AD1899	Road Bridge - over railway / former railway(?)
38.1	Hury, Hury Mill Bridge	13988	396848	519577	Post Medieval - AD1541 to AD1899	Road Bridge - over the River Balder
39.1	Hunderthwaite, nr Town Head Farm	13989	397930	521080	Post Medieval - AD1541 to AD1899	Road Bridge - over ??
40.1	Bishop Auckland	14060	421334	529959	Post Medieval - AD1541 to AD1899	Road Bridge - over the River Gaunless
41.1	Bishop Auckland, Jock's Bridge	14070	421418	530706	Post Medieval - AD1541 to AD1899	Road Bridge - over the River Gaunless
42.1	Bishop Auckland, Etherley Lane	14084	420421	529149	Post Medieval - AD1541 to AD1899	Road Bridge - over railway
43.1	Cowshill, Aller's Bridge	14395	384974	541078	Post Medieval - AD1541 to AD1899	Road Bridge - over Killhope Burn
44.1	Neasham Hall Bridge	11427	432569	509348	Post Medieval - AD1541 to AD1899	Road Bridge - over ?? - **Probably Modern (1909)**

POST MEDIEVAL ROADS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Ebchester, Mill Lane	28	410260	555600	Post Medieval - AD 1541 to AD 1899	Possible quarry road, heading NNW / SSE
2.1	Ireshopeburn, Stonyhill Syke	2250	382740	536830	Post Medieval - AD 1541 to AD 1899	Paved trackway, possibly from Great Stony Hill workings
2.2	Ireshopeburn, Stonyhill Syke	2250	382770	538070	Post Medieval - AD 1541 to AD 1899	Paved trackway, possibly from Great Stony Hill workings
3.1	Langdon Beck	2255	385590	530810	Post Medieval - AD 1541 to AD 1899	Road cutting, for a coach road near Langdon Beck
3.2	Langdon Beck	2255	385750	530750	Post Medieval - AD 1541 to AD 1899	Road cutting, for a coach road near Langdon Beck
4.1	Stanhope, show field	2325	399250	539050	Post Medieval - AD 1541 to AD 1899	Roadway, probably to Newlandside Quarry
5.1	Darlington, part of Great North Road	7299	429040	514900	Post Medieval - AD 1541 to AD 1899	Road lowered to pass below Stockton and Darlingotn
5.2	Darlington, part of Great North Road	7299	429040	515850	Post Medieval - AD 1541 to AD 1899	Road lowered to pass below Stockton and Darlingotn
6.1	Edmundbyers, historic settlement	8784	401479	549829	Post Medieval - AD 1541 to AD 1899	Main B6278 Road, Thack Bank
6.2	Edmundbyers, historic settlement	8784	401557	549894	Post Medieval - AD 1541 to AD 1899	Main B6278 Road, Thack Bank
6.3	Edmundbyers, historic settlement	8784	401669	550028	Post Medieval - AD 1541 to AD 1899	Main B6278 Road, Thack Bank
6.4	Edmundbyers, historic settlement	8784	401855	550074	Post Medieval - AD 1541 to AD 1899	Main B6278 Road, Thack Bank
7.1	Edmundbyers, historic settlement	8834	401342	401342	Post Medieval - AD 1541 to AD 1899	Drove Road leading to summer pastures

POST MEDIEVAL ROADS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
8.1	Wearhead, Historic Settlement Patterns	8878	385922	539595	Post Medieval - AD 1541 to AD 1899	Road, heading NE from Wearhead though disused Quarry
8.2	Wearhead, Historic Settlement Patterns	8878	385991	539670	Post Medieval - AD 1541 to AD 1899	Road, heading NE from Wearhead though disused Quarry
9.1	Wearhead, Historic Settlement Patterns	8879	385815	539684	Post Medieval - AD 1541 to AD 1899	Road, heading N / S through Wearhead
9.2	Wearhead, Historic Settlement Patterns	8879	385831	539593	Post Medieval - AD 1541 to AD 1899	Road, heading N / S through Wearhead
10.1	Durham City, Farewell Hall	9400	426156	539403	Post Medieval - AD 1541 to AD 1899	Post-medieval carriage way

ROADS MODERN

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Brignall, Moor House Farm	3514	404930	511590	Modern - AD1900 to present	Possible Roman Road or Trackway associated with lime kilns
2.1	Bowes, Wst End Service Station	3703	398890	513550	Modern - AD1900 to present	Possible Roman Road from York to Carlisle(?)
3.1	Pont, sewer line	3759	410873	554213	Modern - AD1900 to present	Possible Roman Road, Dere Street(?)
4.1	Murton Moor	6695	437900	546300	Modern - AD1900 to present	Possible Roman Road(?)
4.2	Murton Moor	6695	438300	546200	Modern - AD1900 to present	Possible Roman Road(?)
5.1	Chester-le-Street, Highfield Hospital	7827	427300	552400	Modern - AD1900 to present	Possible Paleo / Bronze Age / Roman / Medieval Road
6.1	Cheste-le-Street, Park View School	8226	427600	551500	Modern - AD1900 to present	Possible Roman Intervallum Road
7.1	Sedgefield, Hardwick Park	8671	434970	528900	Modern - AD1900 to present	Possible Roman Road, Cades Road(?)
8.1	Willington, West Road	9678	419300	535400	Modern - AD1900 to present	Possible Roman Road (?)

ROADS UNDETERMINED

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Wingate	6660	439480	537480	Undetermined	Public Road
2.1	Beamish Burn	7968	422200	554800	Undetermined	Possible Roman Road
3.1	Nr Oxenlaw Farm	8215	408500	545400	Undetermined	Possible Roman Road
4.1	Edmundbyers, Historic Settlement Patterns	8826	401339	550123	Undetermined	Drove Road
5.1	Durham City, Mill Howl Road	9396	425520	541087	Undetermined	Road, possible settlement
6.1	Durham City, Whinney Hill	9576	427910	541639	Undetermined	Public Road
7.1	Durham City, Old Elvet Road	9582	427990	542329	Undetermined	Public Road
8.1	Durham City, Old Elvet Road	9584	427780	542329	Undetermined	Public Road
9.1	Durham City, Old Elvet Road	9586	427810	542319	Undetermined	Public Road

ROADS UNDETERMINED (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
10.1	Durham City, Old Elvet Road	9587	427820	542319	Undetermined	Public Road
11.1	Durham City, Old Elvet Road	9588	427830	542319	Undetermined	Public Road
12.1	Durham City, Old Elvet Road	9589	427820	542309	Undetermined	Public Road
13.1	Durham City, Old Elvet Road	9590	427829	542309	Undetermined	Public Road
14.1	Durham City, Old Elvet Road	9591	427701	542060	Undetermined	Public Road
15.1	Durham City, High Path	9592	427280	542389	Undetermined	Public Road(?)

ROMAN MILESTONES

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Piercebridge	1542	420730	516130	Roman - AD70 to C5	Milestone -C4 - IMP C GAL VAL MAXIMIANO P F
2.1	Willington, Burn	1815	419500	535500	Roman - AD70 to C5	Milestone -C3 - IMP CAESARI MARCO ANT GORDIANO
3.1	Lanchester	1856	416000	546000	Roman - AD70 to C5	Milestone - C? - D N IMP M ANT GORDIANO PIO FELICI AUG
4.1	RokebyGreta Bridge,	1953	408230	514180	Roman - AD70 to C5	Milestone
5.1	Bowes Moor, Stainmore	2650	394800	512700	Roman - AD70 to C5	Milestone - C3 - IMP C M ANNIO FLORIANO PF AUG.
6.1	Bowes Moor, Stainmore	2651	394800	512700	Roman - AD70 to C5	Milestone - C3 - IMP C M AUR CARO PF AUG M...
7.1	Bowes Moor, Stainmore	2652	390650	512230	Roman - AD70 to C5	Milestone - C3 - ...CARO PIO FEL INV AVG. (C2?)
8.1	Bowes Moor, Stainmore	3391	394000	512000	Roman - AD70 to C5	Milestone

ROMAN ROADS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Consett, Dere Street	247	411400	553300	Roman - AD70 to C5	Roman Road
2.1	Byers Green, Whitworth Hall	1445	423000	534000	Roman - AD70 to C5	Roman Road?
3.1	Shildon, Brusselton Wood	1461	420500	525000	Roman - AD70 to C5	Trace of Roman Road
3.2	Shildon, Brusselton Wood	1461	420500	525400	Roman - AD70 to C5	Trace of Roman Road
4.1	Oakenshaw, Weather Hill	1822	419500	538600	Roman - AD70 to C5	Exposed Roman Road?
5.1	Brandon, Dere Street	3028	420200	540000	Roman - AD70 to C5	Roman Road
5.2	Brandon, Dere Street	3028	420300	540000	Roman - AD70 to C5	Roman Road
6.1	Flinthill, Dere Street	3039	416400	546000	Roman - AD70 to C5	Roman Road
6.2	Flinthill, Dere Street	3039	416600	545000	Roman - AD70 to C5	Roman Road
7.1	Flinthill, Dere Street	3040	416000	547000	Roman - AD70 to C5	Roman Road
7.2	Flinthill, Dere Street	3040	416400	546000	Roman - AD70 to C5	Roman Road

ROMAN ROADS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
8.1	Lanchester, Dere Street	3041	415400	548000	Roman - AD70 to C5	Roman Road
8.2	Lanchester, Dere Street	3041	416000	547000	Roman - AD70 to C5	Roman Road
9.1	Lanchester, Dere Street	3042	415000	548400	Roman - AD70 to C5	Roman Road
9.2	Lanchester, Dere Street	3042	415000	548000	Roman - AD70 to C5	Roman Road
10.1	Iveston, Dere Street	3045	413700	550000	Roman - AD70 to C5	Roman Road
10.2	Iveston, Dere Street	3045	414000	549600	Roman - AD70 to C5	Roman Road
11.1	Lanchester, Dere Street	3046	414000	549600	Roman - AD70 to C5	Roman Road
11.2	Lanchester, Dere Street	3046	414600	549000	Roman - AD70 to C5	Roman Road
12.1	Lanchester, Dere Street	3116	416600	545000	Roman - AD70 to C5	Roman Road
12.2	Lanchester, Dere Street	3116	417000	544300	Roman - AD70 to C5	Roman Road
13.1	Quebec, Dere Street	3117	417000	544300	Roman - AD70 to C5	Roman Road
13.2	Quebec, Dere Street	3117	417400	544000	Roman - AD70 to C5	Roman Road
14.1	Lanchester, Dere Street	3118	417400	544000	Roman - AD70 to C5	Roman Road
14.2	Lanchester, Dere Street	3118	418000	543600	Roman - AD70 to C5	Roman Road
15.1	Esh Winning, Dere Street	3119	418000	543600	Roman - AD70 to C5	Roman Road
15.2	Esh Winning, Dere Street	3119	419000	542900	Roman - AD70 to C5	Roman Road
16.1	Esh Winning, Dere Street	3120	419000	542900	Roman - AD70 to C5	Roman Road
16.2	Esh Winning, Dere Street	3120	420000	542300	Roman - AD70 to C5	Roman Road
17.1	Brandon, Dere Street	3121	419700	539000	Roman - AD70 to C5	Roman Road
17.2	Brandon, Dere Street	3121	420000	539600	Roman - AD70 to C5	Roman Road
18.1	Brandon, Dere Street	3122	419600	538000	Roman - AD70 to C5	Roman Road
18.2	Brandon, Dere Street	3122	419700	538000	Roman - AD70 to C5	Roman Road
19.1	Oakenshaw, Dere Street	3123	419600	537000	Roman - AD70 to C5	Roman Road
19.2	Oakenshaw, Dere Street	3123	419600	538000	Roman - AD70 to C5	Roman Road
20.1	Oakenshaw, Dere Street	3124	419400	536000	Roman - AD70 to C5	Roman Road
20.2	Oakenshaw, Dere Street	3124	419600	537000	Roman - AD70 to C5	Roman Road
21.1	Willington, Dere Street	3126	419000	535000	Roman - AD70 to C5	Roman Road
21.2	Willington, Dere Street	3126	419400	536000	Roman - AD70 to C5	Roman Road
22.1	Willington	3127	420000	535900	Roman - AD70 to C5	Roman Road (Roman Road branching off)
23.1	Brandon	3130	423244	538886	Roman - AD70 to C5	Roman Road (course of)
24.1	Brancepeth	3131	422734	538489	Roman - AD70 to C5	Roman Road (course of)
25.1	Willington	3132	420727	536581	Roman - AD70 to C5	Roman Road (course of)
26.1	Brandon, Dere Street	3133	420000	539600	Roman - AD70 to C5	Roman Road (course of)
26.2	Brandon, Dere Street	3133	420200	540000	Roman - AD70 to C5	Roman Road (course of)
27.1	Binchester, Dere Street	3135	420400	531700	Roman - AD70 to C5	Roman Road
27.2	Binchester, Dere Street	3135	420700	531400	Roman - AD70 to C5	Roman Road
28.1	Chester-le-Street to Aycliffe	3136	427200	549800	Roman - AD70 to C5	Possible Roman Road
28.2	Chester-le-Street to Aycliffe	3136	427300	525000	Roman - AD70 to C5	Possible Roman Road
29.1	Staindrop	3168	413000	521600	Roman - AD70 to C5	Roman Road
29.2	Staindrop	3168	414000	522100	Roman - AD70 to C5	Roman Road

ROMAN ROADS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
30.1	Staindrop	3169	414000	522100	Roman - AD70 to C5	Roman Road
30.2	Staindrop	3169	415000	522700	Roman - AD70 to C5	Roman Road
31.1	Staindrop	3170	412000	521100	Roman - AD70 to C5	Roman Road
31.2	Staindrop	3170	413000	521600	Roman - AD70 to C5	Roman Road
32.1	Staindrop	3171	411000	520500	Roman - AD70 to C5	Roman Road
32.2	Staindrop	3171	412000	521100	Roman - AD70 to C5	Roman Road
33.1	Staindrop	3172	410100	520000	Roman - AD70 to C5	Roman Road
33.2	Staindrop	3172	411000	520500	Roman - AD70 to C5	Roman Road
34.1	Bishop Aukland	3174	420000	529000	Roman - AD70 to C5	Roman Road
35.1	Denton	3176	422000	520000	Roman - AD70 to C5	Roman Road
36.1	Walworth, Walworth Gate	3177	423000	520000	Roman - AD70 to C5	Roman Road (course of)
37.1	Walworth, Walworth Gate	3178	423000	520000	Roman - AD70 to C5	Roman Road (course of)
38.1	Denton	3179	421000	520000	Roman - AD70 to C5	Roman Road (course of)
39.1	Summerhouse	3180	420000	520000	Roman - AD70 to C5	Roman Road (course of)
40.1	Cornforth	3181	432000	534000	Roman - AD70 to C5	Roman Road (course of)
41.1	Cornforth	3182	433000	534000	Roman - AD70 to C5	Roman Road (course of)
41.2	Bishop Middleham	3183	433000	533000	Roman - AD70 to C5	Roman Road (course of)
42.1	Bishop Middleham	3184	434000	532000	Roman - AD70 to C5	Roman Road (course of)
43.1	Mordon	3185	434000	527000	Roman - AD70 to C5	Roman Road (course of)
44.1	Mordon	3186	434000	526000	Roman - AD70 to C5	Roman Road (course of)
45.1	Stainton, Streatlam Park	3196	409000	519200	Roman - AD70 to C5	Roman Road (course of - Lavatae to Vinovia)
45.2	Stainton, Streatlam Park	3196	410000	519800	Roman - AD70 to C5	Roman Road (course of - Lavatae to Vinovia)
46.1	Stainton	3197	408000	518000	Roman - AD70 to C5	Roman Road (course of)
47.1	Stainton	3198	407000	518000	Roman - AD70 to C5	Roman Road (course of)
48.1	Barnard Castle	3199	406000	517000	Roman - AD70 to C5	Roman Road (course of)
49.1	Greta Bridge, The Street	3204	405000	513000	Roman - AD70 to C5	Roman Road (course of)
50.1	Greta Bridge, The Street	3205	406000	513000	Roman - AD70 to C5	Roman Road (course of)
51.1	Greta Bridge, The Street	3206	407000	513000	Roman - AD70 to C5	Roman Road (course of)
52.1	Bowes to Barnard Castle	3208	402552	514946	Roman - AD70 to C5	Roman Road (course of)
53.1	Bowes, the Street	3209	400000	513000	Roman - AD70 to C5	Roman Road (course of)
54.1	Bowes, the Street	3210	401000	513000	Roman - AD70 to C5	Roman Road (course of)
55.1	Bowes, the Street	3211	402000	513000	Roman - AD70 to C5	Roman Road (course of)
56.1	Bowes, the Street	3212	403000	513000	Roman - AD70 to C5	Roman Road (course of)
57.1	Bowes, the Street	3213	404000	513000	Roman - AD70 to C5	Roman Road (course of)
58.1	Hutton Magna A66	3225	411600	511100	Roman - AD70 to C5	Roman Road (course of)
58.2	Hutton Magna A66	3225	413400	510000	Roman - AD70 to C5	Roman Road (course of)
59.1	Bishop Auckland	3226	420000	527000	Roman - AD70 to C5	Roman Road (course of)
60.1	Durham to Bishop Auckland	3227	428330	543410	Roman - AD70 to C5	Roman Road (course of)
61.1	Great Stainton, Cades Road	3242	433000	523000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
62.1	Great Stainton, Cades Road	3243	434000	523000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
63.1	Great Stainton, Cades Road	3245	433000	522000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)

ROMAN ROADS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
64.1	Shildon(?),Cades Road	3248	434000	524000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
65.1	Mordon(?), Cades Road	3249	434000	525000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
66.1	Mordon(?),Cades Road	3250	434000	526000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
67.1	Cornforth, Cades Road	3326	432000	534000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
68.1	Coxhoe, Cades Road	3328	432000	535000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
69.1	Coxhoe, Cades Road	3329	431000	535000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
70.1	Coxhoe, Cades Road	3330	431000	536000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
71.1	Coxhoe, Cades Road	3331	431000	537000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
72.1	Bowburn, Cades Road	3332	430000	537000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
73.1	Bowburn, Cades Road	3333	430000	538000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
74.1	Bowburn, Cades Road	3334	430000	539000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
75.1	Bowburn, Cades Road	3335	429000	539000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
76.1	Shincliffe, Cades Road	3336	429000	540000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
77.1	Durham City, Cades Road	3337	429000	541000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
78.1	Durham City, Cades Road	3338	428000	541000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
79.1	Durham City, Cades Road	3339	428000	542000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
80.1	Durham City(?) Cades Road	3340	428000	543000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
81.1	Framwellgate Moor, Cades Road	3342	427000	545000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
82.1	Framwellgate Moor, Cades Road	3343	427000	546000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
83.1	Framwellgate Moor, Cades Road	3344	427000	547000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
84.1	Plawsworth, Cades Road	3345	427000	548000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
85.1	Chester-le-Street, Cades Road	3346	427000	549000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
86.1	Chester-le-Street, Cades Road	3347	427000	550000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
87.1	Chester-le-Street, Cades Road	3348	427000	551000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
88.1	Cades Road	3349	427600	551300	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
88.2	Cades Road	3349	428000	544000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
88.3	Cades Road	3349	433600	522500	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
88.4	Cades Road	3349	434919	529005	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
89.1	Sedgefield, Cades Road	3350	434000	528000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
90.1	Sedgefield, Cades Road	3351	434000	527000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
91.1	Sedgefield, Cades Road	3352	434000	529000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
92.1	Sedgefield, Cades Road	3353	434000	530000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
93.1	Bishop Middleham, Cades Road	3354	434000	531000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
94.1	Bishop Middleham, Cades Road	3355	434000	532000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
95.1	Bishop Middleham, Cades Road	3356	433000	532000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
96.1	Bishop Middleham, Cades Road	3357	433000	533000	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
97.1	Bowes Moor, Stainmore	3419	394000	512000	Roman - AD70 to C5	Roman Road (York to Carlisle)
98.1	Bowes Moor, Stainmore	3420	392000	512000	Roman - AD70 to C5	Roman Road (York to Carlisle)
98.2	Bowes Moor, Stainmore	3420	393000	512000	Roman - AD70 to C5	Roman Road (York to Carlisle)
99.1	Bowes Moor, Stainmore	3422	391000	512000	Roman - AD70 to C5	Roman Road (York to Carlisle)
100.1	Bowes Moor, Stainmore	3423	390000	512000	Roman - AD70 to C5	Roman Road (York to Carlisle), or Turnpike, or both
101.1	Bowes Moor, Stainmore	3424	389000	512000	Roman - AD70 to C5	Roman Road (York to Carlisle), or Turnpike, or both
102.1	Egglestone to Stanhope Road	5636	398798	532873	Roman - AD70 to C5	Roman Road

ROMAN ROADS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
103.1	Willington	5768	419307	535367	Roman - AD70 to C5	Roman Road (Roman Road branching off Dere Street to NE)
104.1	Esh Winning, Dere Street	6525	419893	542381	Roman - AD70 to C5	Roman Road
105.1	Middleton-St-George, Cades Road(?)	6716	434334	515432	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
105.2	Middleton-St-George, Cades Road(?)	6716	434425	512446	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
106.1	Sedgefield, Cades Road	15710	434987	529598	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
106.2	Sedgefield, Cades Road	15710	435119	529598	Roman - AD70 to C5	Roman Road (Gt. Stainton to Chester-le-Street)
107.1	Bowes	3703	398890	513550	Roman - AD70 to C5	Possible Roman Road (York to Carlisle)
108.1	Pont, Dere Street(?)	3759	410873	554213	Roman - AD70 to C5	Roman Road(?)
109.1	Murton Moor	6695	437900	546300	Roman - AD70 to C5	Roman Road(?)
109.2	Murton Moor	6695	438300	546200	Roman - AD70 to C5	Roman Road(?)
110.1	Chester-le-Street	7827	427300	552400	Roman - AD70 to C5	Roman Road(?), plus Meso / Neo evidence
111.1	Beamish Burn	7968	422200	554800	Roman - AD70 to C5	Roman Road(?) agger
112.1	Oxenlaw Farm	8215	408500	545400	Roman - AD70 to C5	Roman Road(?) agger
113.1	Chester-le-Street	8226	427600	551500	Roman - AD70 to C5	Roman Road - possible inter vallum
114.1	Sedgefield, Hardwick Park	8671	434970	528900	Roman - AD70 to C5	Roman Settlement(?) on Cades Road
115.1	Willington	9678	419300	535400	Roman - AD70 to C5	Roman Road(?)

TRACKWAYS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Thrislington	1105	429740	533190	Medieval - AD1066 to AD1540	Paved Pathway - Thrislington to Ferryhill
1.2	Thrislington	1105	430170	533400	Medieval - AD1066 to AD1540	Paved Pathway - Thrislington to Ferryhill
2.1	Sacriston	1326	423340	548470	Undetermined	Crop mark of tracks E / W nr Sacriston woods
3.1	Brandon, Wooley Close	1821	419140	538760	Undetermined	Crop marks in nearby fields
4.1	Outen, Sledge Hill	2480	425100	554800	Prehistoric - to AD70	Double ditch pathway
5.1	Blackton	3298	393100	518100	Post Medieval - AD1541 to AD1899	Two tracks
6.1	Baldersdale, Blackton Bridge	3299	393500	518300	Post Medieval - AD1541 to AD1899	Track
7.1	Lambton Castle, North Lodge 2	3472	428000	553300	Undetermined	Ditched trackway(?)
8.1	Barningham Moor	5720	405220	507460	Roman - AD70 to C5	Trackway
8.2	Barningham Moor	5720	405250	507500	Roman - AD70 to C5	Trackway
8.3	Barningham Moor	5720	405280	507550	Roman - AD70 to C5	Trackway
9.1	West Rainton, Mally Gill	6667	430590	545560	Undetermined	Paved Stream
10.1	Bowburn, South Kelloe	6997	432297	536437	Modern - AD1900 to present	Incline
11.1	Westgate, Brecken Hill	7077	391347	538285	Roman - AD70 to C5	Routeway
12.1	Eastgate, Rookhope Road	7106	394563	540079	Post Medieval - AD1541 to AD1899	Track
13.1	Sunderland, Cleugh Quarry	7110	393808	539889	Post Medieval - AD1541 to AD1899	Stone quarry, kiln and track
14.1	Sunderland, Cleugh Boundary	7113	393363	540079	Medieval - AD1066 to AD1540	Bank and Ditch Boundary and later Track
15.1	Sunderland, Cleugh Trackway	7115	393623	539976	Medieval - AD1066 to AD1540	A series of Hollow Ways

TRACKWAYS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
16.1	Eastgate, Cragside	7147	395085	538911	Undetermined	A small Hollow Way
17.1	Eastgate, Cragside	7164	395072	538887	Medieval - AD1066 to AD1540	Two tracks
18.1	Eastgate, Cragside	7166	394734	538869	Post Medieval - AD1541 to AD1899	Post Medieval Track (Routeway)
19.1	Eastgate, Heights Quarry	7249	393028	538819	Roman - AD70 to C5	A slight Hollow Way
20.1	Eastgate, Cambo Keels	7356	393474	538318	Medieval - AD1066 to AD1540	Routeway
21.1	Westgate, Old Park Farm	7383	392479	538310	Modern - AD1900 to present	Routeway
21.2	Westgate, Old Park Farm	7383	392509	538338	Modern - AD1900 to present	Routeway
22.1	Westgate, Old Park Farm	7396	392672	538307	Roman - AD70 to C5	Hollow Way
22.2	Westgate, Old Park Farm	7396	392690	538282	Roman - AD70 to C5	Hollow Way
23.1	Westgate, Peat Hill Brow	7633	390891	538704	Undetermined	Boundary
24.1	Westgate, Middlehope Burn	7657	390501	539429	Post Medieval - AD1541 to AD1899	Mining Routeway
25.1	Westgate, West Slitt / Low Slitt Mine	7675	390520	539214	Post Medieval - AD1541 to AD1899	Mining Routeway
26.1	Westgate, West Slitt / Low Slitt Mine	7676	390552	539181	Post Medieval - AD1541 to AD1899	Mining Routeway
27.1	Killhope	7743	382417	543165	Undetermined	Track
28.1	Hamsterly, Steel Beck	7868	404800	532800	Post Medieval - AD1541 to AD1899	Bouse Teams
29.1	Raby Castle, Raby Park	7966	412800	522000	Post Medieval - AD1541 to AD1899	Hollow Way, Ridge and Furrow
30.1	Westgate, Stone Carrs	8188	391079	537328	Undetermined	Boundary
31.1	Westgate, Stone Carrs	8189	391032	537380	Undetermined	Bank / Boundary
31.2	Westgate, Stone Carrs	8189	391072	537346	Undetermined	Bank / Boundary
31.3	Westgate, Stone Carrs	8189	391137	537418	Undetermined	Bank / Boundary
32.1	Sedgefield, Home Farm	8222	434530	528380	Undetermined	Enclosure and Tracks - (Romano-British(?))
33.1	Durham City, The Sands	8223	427560	543000	Modern - AD1900 to present	Building(?) / Track(?) / Ford(?)
34.1	Chester-le-Street, Park View School	8317	427860	551180	Modern - AD1900 to present(?)	Prehistoric(?) / Roman Road(?) / Foundations(?)
35.1	Stanhope, Valley View Lane	8451	399390	540130	Post Medieval - AD1541 to AD1899	Road
36.1	Stanhope, Field Row Lane	8452	399320	540160	Post Medieval - AD1541 to AD1899	Road
37.1	Westgate	8727	390640	538242	Undetermined	Path
38.1	Killhope, Bank Foot Farm	8766	380756	543099	Post Medieval - AD1541 to AD1899	Trackway
39.1	Stanhope, Stanhope Park	9062	394657	537743	Undetermined	Ramp / Track
40.1	Eastgate, Horsley Burn Valley	9165	397320	538173	Undetermined	Routeway - (Medieval to C19(?))
41.1	Eastgate, Horsley Burn Valley	9166	397235	538114	Post Medieval - AD1541 to AD1899	Routeway
42.1	Stanhope, Stanhope Park	9192	395030	538088	Undetermined	Routeway
43.1	Durham City, Western Bypass	9401	423716	542887	Medieval - AD1066 to AD1540	Trackways
43.2	Durham City, Western Bypass	9401	424749	542208	Medieval - AD1066 to AD1540	Trackways
43.3	Durham City, Western Bypass	9401	425235	5543180	Medieval - AD1066 to AD1540	Trackways
44.1	Wolsingham, nr Hag Gate	9425	??	??	Post Medieval - AD1541 to AD1899	Trackways (three off) (Co-ornates not given on PRN)
45.1	Wolsingham	9431	??	??	Post Medieval - AD1541 to AD1899	Gully (Co-ornates not given on PRN)
46.1	Wolsingham	9433	??	??	Post Medieval - AD1541 to AD1899	Track (Co-rdinates not given on PRN)
47.1	Wolsingham	9519	??	??	Post Medieval - AD1541 to AD1899	Track (Co-ordinates not given on PRN)
48.1	Ramshaw, Jeffrey's Mill	15723	395470	547833	Post Medieval - AD1541 to AD1899	Smelting Mill complex
49.1	Ramshaw, Jeffrey's Mill	15724	395478	547827	Post Medieval - AD1541 to AD1899	Smelt Mill Flues
50.1	West Cornforth, Thrislington Quarry	15761	432750	533298	Undetermined	Ring Gulley / Ditch / Post Boundary
51.1	Hedleyhope, Tow Law	15848	412355	539999	Post Medieval - AD1541 to AD1899	Trackway

DROVE DATA

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Cowshill, Low Allers Cottage	14397	384946	541048	Post Medieval - AD1541 to AD1899	Possibly late C18.

2.1	High Honiscliffe, Old Farmhouse	296	422537	515367	Medieval - AD1066 to AD1540	Thought to be a defensive building
3.1	Wolsingham, Baal Hill House	2177	407448	538554	Medieval - AD1066 to AD1540	Bastle
4.1	Ireshopeburn, Amrita Cottage	3492	386700	539100	Post Medieval - AD1541 to AD1899	Bastle
5.1	Westgate, Swinhopeburn	3493	390900	537500	Post Medieval - AD1541 to AD1899	Bastle
6.1	St. John's Chapel, Bonnymoor Cottage	3494	388300	537800	Post Medieval - AD1541 to AD1899	Bastle
7.1	St. John's Chapel, Harthopeburn Cottage	3495	388300	537800	Post Medieval - AD1541 to AD1899	Bastle
8.1	Hunstanworth, Buckshott Farmhouse and Byres	3498	397304	549692	Post Medieval - AD1541 to AD1899	Bastle
9.1	Killhope, Killhopeburn Sheiling	3954	383500	541700	Post Medieval - AD1541 to AD1899	Bastle
10.1	Cowshill, Bridge End	3955	385200	540700	Post Medieval - AD1541 to AD1899	Bastle
11.1	Eastgate, Weardale	8695	395275	538880	Modern - AD1900 to present	Pele Tower
12.1	Cowshill, Bridge End	14173	385202	540702	Post Medieval - AD1541 to AD1899(?)	Bastle
13.1	Killhope, Kilhopeburn	14205	383542	541763	Post Medieval - AD1541 to AD1899	Bastle
14.1	St. John's Chapel, Island House, East Blackdene	14231	388012	538418	Post Medieval - AD1541 to AD1899	Bastle(?)
15.1	Newhouse, Reading Room and Cottage	14280	387303	538890	Post Medieval - AD1541 to AD1899	Bastle(?)
16.1	Wolsinham, Baal Hill Farmhouse	14355	407444	538551	Post Medieval - AD1541 to AD1899	Bastle(?)
17.1	Hunstanworth, The Old Farmhouse	15896	395015	549075	Post Medieval - AD1541 to AD1899	Bastle(?)
18.1	Beamish, Pockerley Farmhouse	295	422300	554500	Medieval - AD1066 to AD1540	Pele Tower
19.1	Bishop Auckland, Park Head Farm	14005	423010	530996	Post Medieval - AD1541 to AD1899	Bullpen
20.1	High Shipley	3817	401470	521580	Post Medieval - AD1541 to AD1899	Byres and Loft.
21.1	Westgate, New Park Farm	7432	391888	538382	Post Medieval - AD1541 to AD1899	Byre
22.1	Bearpark, Lodge Farm	7943	423100	544200	Post Medieval - AD1541 to AD1899	Undetermined
23.1	Stanhope, Fell Cottage	8443	399320	540270	Post Medieval - AD1541 to AD1899	Cottage and Byre
24.1	Stanhjope, The Green	8444	399330	540160	Post Medieval - AD1541 to AD1899	Undetermined
25.1	Stanhope, Viewlands	8445	399320	540270	Post Medieval - AD1541 to AD1899	Undetermined
26.1	Edmundbyers, Edmundbyers Cottage	8796	401630	549961	Post Medieval - AD1541 to AD1899	Byre
27.1	Park Head Farm, Bishop Auckland	14588	422954	530849	Post Medieval - AD1541 to AD1899	Cattle Shelter
28.1	Summerhouse, Farm Buildings	11070	420278	519071	Post Medieval - AD1541 to AD1899	Cow House
29.1	Walworth, Farm Buildings	11079	423966	517678	Post Medieval - AD1541 to AD1899	Cow House
30.1	Coatham Mundeveille< Farm Buildings	11423	428514	520555	Post Medieval - AD1541 to AD1899	Cow House(?)
31.1	Brafferton, Farm Buildings	11432	430153	519535	Post Medieval - AD1541 to AD1899	Cow House(?)
32.1	Great Burdon, Farm Buildings	11435	431896	516410	Post Medieval - AD1541 to AD1899	Cow House
33.1	Houghton BankToytop Farmhouse and Buildings	11492	421622	522644	Post Medieval - AD1541 to AD1899	Cow House
34.1	Houghton-le-Side,Farm Buildings E. of Manor House	11564	422547	521811	Post Medieval - AD1541 to AD1899	Cow House
35.1	Walworth, Farm Buildings S. of Castle Farm	11587	422884	518592	Post Medieval - AD1541 to AD1899	Cow House
36.1	Castleside, Farm Building at Fell Close Cottage	11623	406786	547647	Post Medieval - AD1541 to AD1899	Cow House
37.1	Ushaw College, Farm Buildings at Ushaw Home Farm	11649	421467	543616	Post Medieval - AD1541 to AD1899	Cow House
38.1	Beamish Mus., Farm Buildings at Beamish Hall Farm	11775	421512	554294	Post Medieval - AD1541 to AD1899	Cow House
39.1	MuggleswickBuilding remains at Priory Farm	11831	404454	550032	Medieval - AD1066 to AD1540	Cow House
40.1	Lanchester, East Barn at Broadwood Home Farm	11895	412728	545509	Post Medieval - AD1541 to AD1899	Cow House
41.1	Durham City, Language Laboratory	11935	427063	541208	Post Medieval - AD1541 to AD1899	Cow House

DROVE DATA (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
42.1	Brandon, New Ivesley Farmhouse	12003	417438	541036	Post Medieval - AD1541 to AD1899	Cow House
43.1	Bearpark, Lodge Farm	12019	423268	544179	Post Medieval - AD1541 to AD1899	Cow House
44.1	Hett, Slashpool House	12042	428229	536609	Post Medieval - AD1541 to AD1899	Cow House
45.1	Sunderland Bridge, 'Low Butterby(?)	12044	427577	539340	Post Medieval - AD1541 to AD1899	Cow House
46.1	Shincliffe, Laxey Cottage	12057	429105	540644	Post Medieval - AD1541 to AD1899	Cow House
47.1	Brancepeth, N. Morley Farmhouse(?)	12067	422103	539396	Post Medieval - AD1541 to AD1899	Cow House
48.1	Hett, High Grange Farmhouse	12209	428147	536769	Post Medieval - AD1541 to AD1899	Cow House
49.1	Brandon, High Waterhouse Farm	12482	418354	540820	Post Medieval - AD1541 to AD1899	Cow House
50.1	Wingate, Hurworth Bryan Farm	12565	439444	535247	Post Medieval - AD1541 to AD1899	Cow House
51.1	Murton, East Murton Farmhouse	12619	438618	547100	Post Medieval - AD1541 to AD1899	Cow House
52.1	Hunderthwaite, Doe Park	12482	400573	520353	Post Medieval - AD1541 to AD1899	Cow House
53.1	Balderdale, High Birk Hat Farm	12844	393338	518761	Post Medieval - AD1541 to AD1899	Cow House
54.1	Balderdale, High Birk Hat Farm	12845	393326	518743	Post Medieval - AD1541 to AD1899	Cow House
55.1	Hunderthwaite, Field Barn N.E. of Moor View	12850	398998	521294	Post Medieval - AD1541 to AD1899	Cow House
56.1	Laithkirk, Byre House	12860	395504	524049	Post Medieval - AD1541 to AD1899	Cow House
57.1	Baldersdale, Clove Lodge Farmhouse	12870	393574	517775	Post Medieval - AD1541 to AD1899	Cow House
58.1	Cotherstone, Tree Farm	12872	397325	519129	Post Medieval - AD1541 to AD1899	Cow House
59.1	Cotherstone, Gilmour House	12877	401143	519744	Post Medieval - AD1541 to AD1899	Cow House
60.1	Bowes, Haulands Cottage	12892	401502	513888	Post Medieval - AD1541 to AD1899	Cow House
61.1	Bowes, West End Farm	12902	398999	513574	Post Medieval - AD1541 to AD1899	Cow House
62.1	Westwick, Buildings at East Whorley Hill	12919	411655	516441	Post Medieval - AD1541 to AD1899	Cow House
63.1	Whorlton, Humbleton Farmhouse	12923	409231	517299	Post Medieval - AD1541 to AD1899	Cow House
64.1	Gainford, Alwent Mill House	12931	414540	518385	Post Medieval - AD1541 to AD1899	Cow House
65.1	Middleton-in-Teesdale, Wood Edge House	13014	394290	526757	Post Medieval - AD1541 to AD1899	Cow House
66.1	Buildings East of Greenfield Farm, High Etherley	13229	416868	528201	Post Medieval - AD1541 to AD1899	Cow House
67.1	Mickleton, 'Field Barn, Greegates Lane	13237	397135	524550	Post Medieval - AD1541 to AD1899	Cow House
68.1	Mickleton, High Green Farmhouse	13240	397500	523519	Post Medieval - AD1541 to AD1899	Cow House
69.1	Baldersdale, Levy Pool Farmhouse	13276	396823	515427	Post Medieval - AD1541 to AD1899	Cow House
70.1	Baldersdle, Clove Lodge Farmhouse	13295	393562	517778	Post Medieval - AD1541 to AD1899	Cow House
71.1	Cotherstone, Towler Hill Farmhouse Lartington Lane	13305	403641	517884	Post Medieval - AD1541 to AD1899	Cow House
72.1	Winston, Walker Hall	13310	412940	517138	Post Medieval - AD1541 to AD1899	Cow House
73.1	Barningham, Cowclose House	13346	406382	509586	Post Medieval - AD1541 to AD1899	Cow House
74.1	Lunedale, East Nettlepot Farmhouse	13382	392077	522250	Post Medieval - AD1541 to AD1899	Cow House
75.1	Scargill, Castle Farmhouse	13437	405297	510763	Post Medieval - AD1541 to AD1899	Cow House
76.1	Scargill, Cottage at Castle Farmhouse	13439	405295	510783	Post Medieval - AD1541 to AD1899	Cow House
77.1	Barnard Castle, Demesnes Mill	13501	405345	515854	Post Medieval - AD1541 to AD1899	Cow House
78.1	Barnard Castle	13674	404938	516336	Post Medieval - AD1541 to AD1899	Cow House
79.1	E. of Staindrop Cemetery, Field Byre	13751	413554	520690	Post Medieval - AD1541 to AD1899	Cow House
80.1	Hamsterley, Edge Knoll Farmhouse	13909	413309	531767	Post Medieval - AD1541 to AD1899	Cow House
81.1	Headlam, Hill House	13954	418398	517909	Post Medieval - AD1541 to AD1899	Cow House
82.1	Bowbank, West Wood Farmhouse	13969	394571	523717	Post Medieval - AD1541 to AD1899	Cow House

DROVE DATA (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
82.1	Bowbank, West Wood Farmhouse	13969	394571	523717	Post Medieval - AD1541 to AD1899	Cow House
83.1	Baldersdale, Mere Beck Farmhouse	13973	394874	518146	Post Medieval - AD1541 to AD1899	Cow House
84.1	Bowes, Farm Buildings	13985	400700	513512	Post Medieval - AD1541 to AD1899	Cow House
85.1	Bishop Auckland, Park Head Farm	14075	423052	531011	Post Medieval - AD1541 to AD1899	Cow House
86.1	Crook and Willington, Farm Buildings	14119	422005	536691	Post Medieval - AD1541 to AD1899	Cow House
87.1	Crook and Willington, Farm Buildings	14146	421346	538223	Post Medieval - AD1541 to AD1899	Cow House
88.1	Edmundbyers, Pedams Oak Farmhouse	14150	398697	548374	Post Medieval - AD1541 to AD1899	Cow House
89.1	Hunstanworth, Buckshott Farmhouse and Byres	14151	397307	549692	Post Medieval - AD1541 to AD1899	Cow House
90.1	Edmundbyers, Cottage at Pedams Oak Farmhouse	14155	398736	548392	Post Medieval - AD1541 to AD1899	Cow House
91.1	Hunstanworth, Hunstanworth Farm East Byre	14165	395041	549068	Post Medieval - AD1541 to AD1899	Cow House
92.1	St. John's Chapel, Farm Buildings at Dry Gill	14194	389019	537787	Post Medieval - AD1541 to AD1899	Cow House
93.1	Westgate, Old Park Farmhouse Out Buildings	14200	392736	538237	Post Medieval - AD1541 to AD1899	Cow House
94.1	Stanhope, Unthank Mill Houses	14202	399388	539107	Post Medieval - AD1541 to AD1899	Cow House
95.1	Killhope, Killhopeburn Sheiling	14205	383542	541763	Post Medieval - AD1541 to AD1899	Cow House
96.1	Westgate, 'Old Park Farmhouse Out Buildings	14209	392719	538223	Post Medieval - AD1541 to AD1899	Cow House
97.1	Westgate, Littlewood Farmhouse and Out Buildings	14224	392311	537261	Post Medieval - AD1541 to AD1899	Cow House
98.1	Frosterley, Frosterley House Out Buildings	14240	402780	537025	Post Medieval - AD1541 to AD1899	Cow House
99.1	Eastgate, Former House and Byre	14273	394316	538130	Post Medieval - AD1541 to AD1899	Cow House
100.1	Stanhope, Snape Gate Farmhouse	14282	396661	537016	Post Medieval - AD1541 to AD1899	Cow House
101.1	St. John's Chapel, Bonneymoor and Hopeburn Cottage	14288	388316	537830	Post Medieval - AD1541 to AD1899	Cow House
102.1	Westgate, The Cottage and Farm Buildings	14301	391014	537603	Post Medieval - AD1541 to AD1899	Cow House
103.1	Westgate, New Close Farmhouse	14303	390677	536558	Post Medieval - AD1541 to AD1899	Cow House
104.1	Eastgate, Westernhopeburn Cottage	14317	393426	537836	Post Medieval - AD1541 to AD1899	Cow House
105.1	Eastgate, Westernhopeburn West Farmhouse	14318	393504	537845	Post Medieval - AD1541 to AD1899	Cow House
106.1	Wolsingham, Granny Cottage and Farm Buildings	14332	410558	536272	Post Medieval - AD1541 to AD1899	Cow House
107.1	Wolsingham, Sunniside Farmhouse and Farm Buildings	14339	405387	535884	Post Medieval - AD1541 to AD1899	Cow House
108.1	Wolsingham, East Biggins Farmhouse	14347	404341	535707	Post Medieval - AD1541 to AD1899	Cow House
109.1	Wolsingham, Holebeck Farmhouse and Byre	14348	405498	536430	Post Medieval - AD1541 to AD1899	Cow House
110.1	Wolsingham, Harthope Farm and Byre	14389	406382	534719	Post Medieval - AD1541 to AD1899	Cow House
111.1	Wolsingham, Holywell Farmhouse, Upper Town	14402	407713	537871	Post Medieval - AD1541 to AD1899	Cow House
112.1	Wolsingham, 'Farm Building N. of Wiserley Hall	14405	408559	536254	Post Medieval - AD1541 to AD1899	Cow House
113.1	Wolsingham, Barn and Byre E. of Ashes Farmhouse	14408	406819	536556	Post Medieval - AD1541 to AD1899	Cow House
114.1	Wolsingham, Buildings S. of Sandy Carr Farmhouse	14427	408832	538779	Post Medieval - AD1541 to AD1899	Cow House
115.1	Ireshopeburn, Whitestones Cottage	14435	386799	539325	Post Medieval - AD1541 to AD1899	Cow House
116.1	Frosterley, High Bishopley Farmhouse	14475	401289	535536	Post Medieval - AD1541 to AD1899	Cow House
117.1	Stanhope, Shield Ash Farmhouse	14491	398521	537514	Post Medieval - AD1541 to AD1899	Cow House
118.1	Frosterley, Willow Green Farmhouse	14511	40397	536961	Post Medieval - AD1541 to AD1899	Cow House
119.1	Edmundbyers, Pedams Oak Farmhouse	14515	398666	548358	Post Medieval - AD1541 to AD1899	Cow House
120.1	Crook, Woodifield Farmhouse	14525	414388	535037	Post Medieval - AD1541 to AD1899	Cow House
121.1	Crook, Stonechester Farmhouse	14529	418048	536520	Post Medieval - AD1541 to AD1899	Cow House
122.1	Bishop Auckland, Park Head Farm	14582	423052	530937	Post Medieval - AD1541 to AD1899	Cow House
123.1	Cornforth, Le Peile	1111	431000	534000	Medieval - AD1066 to AD1540	Pele Tower

DROVE DATA (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
124.1	Ludworth, Ludworth Tower	1146	435580	541300	Medieval - AD1066 to AD1540	Pele Tower
125.1	Heighington, Newbiggin Old House	1455	422110	524030	Medieval - AD1066 to AD1540	Pele Tower
126.1	Manor House, Low Conniscliffe	1582	424720	513770	Medieval - AD1066 to AD1540	Pele Tower
127.1	Witton-le-Wear, Witton Tower	1763	414342	531314	Medieval - AD1066 to AD1540	Pele Tower
128.1	Rokeby, Mortham Tower	1931	408630	514200	Medieval - AD1066 to AD1540	Pele Tower
129.1	Raby Castle, The Old Lodge	2025	409020	522180	Medieval - AD1066 to AD1540	Pele Tower
130.1	Hunstanworth, Remains of Tower	2282	394870	549000	Medieval - AD1066 to AD1540	Pele Tower
131.1	Stanhope, Stone House	2328	399740	539270	Medieval - AD1066 to AD1540	Pele Tower(?)
132.1	Seaham, Dalden tower	2503	442020	548736	Medieval - AD1066 to AD1540	Pele Tower
133.1	Wearhead, Blacklough	189	384000	539000	Medieval - AD1066 to AD1540	Sheiling
134.1	Wearheaad, Beckley Sheild	190	384000	539000	Medieval - AD1066 to AD1540	Sheiling
135.1	Irehopeburn, Burnhope Sheild	191	384000	538000	Medieval - AD1066 to AD1540	Sheiling
136.1	Ireshopeburn	193	386000	538000	Medieval - AD1066 to AD1540	Sheiling
137.1	Ireshopeburn	194	386000	538000	Medieval - AD1066 to AD1540	Sheiling (Duplication?)
138.1	St. John's Chapel, Earnwell	195	387000	538600	Medieval - AD1066 to AD1540	Sheiling
139.1	St. John's Chapel, Middle Black Dean	196	387700	538700	Medieval - AD1066 to AD1540	Sheiling
140.1	Ireshopeburn, Poperd Hill	197	386500	538700	Medieval - AD1066 to AD1540	Sheiling
141.1	Daddry Sheild, Dirt Pot Shield	198	389000	537000	Medieval - AD1066 to AD1540	Sheiling
142.1	Daddry Sheild, Harthopeburn Pen Fold	213	389000	537000	Medieval - AD1066 to AD1540	Sheiling
143.1	Wearhead	218	385000	539000	Medieval - AD1066 to AD1540	Sheiling
144.1	Cowshill, Crookfield	221	384000	540000	Medieval - AD1066 to AD1540	Sheiling
145.1	Cowshil, Heathery Cleugh	222	384600	541400	Medieval - AD1066 to AD1540	Sheiling
146.1	Cowshill, Sparkshield	223	383000	541000	Medieval - AD1066 to AD1540	Sheiling
147.1	Cowshill, Killhope	224	382000	543000	Medieval - AD1066 to AD1540	Sheiling
148.1	Cowshill, Killhope	225	383000	541000	Medieval - AD1066 to AD1540	Sheiling
149.1	Cowshill, Burtreewell	227	385000	540000	Medieval - AD1066 to AD1540	Sheiling
150.1	Holwick, Cetry Bank	424	384300	529800	Medieval - AD1066 to AD1540	Sheiling
151.1	Bowlees, Bridge House	429	389200	528500	Medieval - AD1066 to AD1540	Sheiling
152.1	Holwick, Black Hill Sheepfold	432	381800	527900	Medieval - AD1066 to AD1540	Sheiling
153.1	Holwick, Black Hill 2	433	381800	528200	Medieval - AD1066 to AD1540	Sheiling
154.1	Holwick, Simy Folds 4	445	388400	527800	Medieval - AD1066 to AD1540	Sheiling
155.1	Holwick, Pinshot Currack	450	387900	526500	Medieval - AD1066 to AD1540	Sheiling
156.1	Holwick, Pasture Foot North	451	386980	528090	Medieval - AD1066 to AD1540	Sheiling
157.1	Forest-in-Teesdale, Middle Hurth East	459	386800	530800	Medieval - AD1066 to AD1540(?)	Sheiling
158.1	Holwick, Willy Brig Syke	461	391600	525400	Undetermined	Sheiling or Farmstead
159.1	Holwick, Willy Brig Syke South	462	391600	525400	Undetermined	Sheiling
160.1	Bows Moor, Spital Syke	2424	391800	511800	Undetermined	Sheiling
161.1	Holwick, Head	3103	389100	528200	Undetermined	Sheiling or Farmstead
162.1	Holwick, Grain Beck	3106	380300	527500	Undetermined	Sheiling
163.1	Forest-in-Teesdale, Dineholm Scar	3110	386800	528300	Undetermined	Sheiling(?)
164.1	Holwick, Dry Beck	3111	386700	527800	Undetermined	Farmstead

DROVE DATA (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
165.1	Middleton-in-Teesdale, Elphatory Allotment	3114	395000	529100	Medieval - AD1066 to AD1540	Sheiling(?)
166.1	Baldersdale, Balderhead	3188	392450	517890	Early Medieval - C5 to AD1066	Longhouse and Enclosure
167.1	Ramshaw, Nookton	3363	392540	547610	Medieval - AD1066 to AD1540	Sheiling
168.1	Bowes Moor, Rey Cross	4841	390250	512080	Prehistoric - to AD70	Sheiling
169.1	Bowes Moor, Rey Cross	4844	390250	512080	Medieval - AD1066 to AD1540	Sheiling
170.1	Cotherstone Moor, Bleak Rigg	5427	392400	517800	Undetermined	Sheiling(?)
171.1	Holwick, Crossthwaite Scars	6516	391930	525980	Medieval - AD1066 to AD1540	Sheiling
172.1	Holwick, Holwick Scars	6568	390870	526550	Prehistoric - to AD70	Sheiling
173.1	Westgate, Weardale	8742	390065	537974	Medieval - AD1066 to AD1540	Sheiling
174.1	Muggleswick, Cottage and Enclosure	11738	404160	549946	Undetermined	Sheiling(?)
175.1	Embleton, Cole Hill	12715	442589	531851	Post Medieval - AD1541 to AD1899	Stock Enclosure

INNS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Bishop Auckland, 11-12 King Street	1402	421210	530140	Post Medieval - AD1541 to AD1899	A former Inn
2.1	Bishop Auckland, Queen's Head	1407	421090	530150	Post Medieval - AD1541 to AD1899	Inn
3.1	Bowes Moor, Old Spital	3368	391060	512150	Medieval - AD1066 to AD1540	Inn / Lodging House
4.1	Castle Eden, Castle Eden Inn	3601	442500	537600	Post Medieval - AD1541 to AD1899	Inn
5.1	Westgate, The Lea (formerly The Miners Arms)	8544	390750	538040	Post Medieval - AD1541 to AD1899	A former Inn
6.1	Frosterley, Forester's Arms	8578	402800	536980	Post Medieval - AD1541 to AD1899	Inn
7.1	Frosterley, The Frosterley Inn	8581	402959	536972	Post Medieval - AD1541 to AD1899	Inn
8.1	Frosterley, Black Bull Inn	8586	402360	536930	Post Medieval - AD1541 to AD1899	Inn
9.1	Frosterley, Hare and Hounds	8608	402560	536940	Post Medieval - AD1541 to AD1899	Inn
10.1	Summerhouse, Raby Hunt Inn	11072	420208	519278	Post Medieval - AD1541 to AD1899	Inn
11.1	Heighington, Cock Inn Farnhouse	11575	423559	521444	Post Medieval - AD1541 to AD1899	A former Inn
12.1	Iveston, Board Cottage	11721	413697	550395	Post Medieval - AD1541 to AD1899	A former Inn
13.1	Durham, Rose Tree Inn	12092	426670	542713	Post Medieval - AD1541 to AD1899	A former Inn
14.1	Durham, Bishop Cosin's Hall	12125	427427	542266	Post Medieval - AD1541 to AD1899	A former Inn
15.1	Broompark, West Broom House	12481	424209	541888	Post Medieval - AD1541 to AD1899	A former Inn
16.1	Four Lane Ends, Spenny Moor Cottage	12674	424882	533222	Post Medieval - AD1541 to AD1899	A former Inn
17.1	Hutton Magna, The Oak Tree Inn	13062	412675	512464	Post Medieval - AD1541 to AD1899	Inn
18.1	Whorlton, The Bridge Inn	13303	410531	514932	Post Medieval - AD1541 to AD1899	Inn
19.1	Barningham, 1 and 2 Church View	13333	408564	510386	Post Medieval - AD1541 to AD1899	A former Inn
20.1	Barningham, The Hollies	13337	408604	510422	Post Medieval - AD1541 to AD1899	A former Inn
21.1	Staindrop, 5 and 6 North Green	13361	412749	520627	Post Medieval - AD1541 to AD1899	A former Inn
22.1	Wycliffe, Thorpe Grange Farmhouse	13428	409321	512770	Post Medieval - AD1541 to AD1899	A former Inn
23.1	Barnard Castle, 23 and 25 The Bank	13468	405000	516247	Post Medieval - AD1541 to AD1899	A former Inn
24.1	Barnard Castle, The Turk's Head	13477	405053	516428	Post Medieval - AD1541 to AD1899	Inn
25.1	Barnard Castle, Golden Lion	13575	405010	516463	Post Medieval - AD1541 to AD1899	A former Inn, now a Public House
26.1	Barnard Castle, 34 The Bank	13600	405015	516209	Post Medieval - AD1541 to AD1899	A former Inn

INNS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
27.1	Barningham, The Millbank Arms	13848	408591	510360	Post Medieval - AD1541 to AD1899	Inn
28.1	Greta Bridge, 1 and 2 The Square	13864	408615	513133	Post Medieval - AD1541 to AD1899	A former Inn
29.1	Startforth, High West Wood (C19 the Reservoir Inn)	13890	403590	515749	Post Medieval - AD1541 to AD1899	A former Inn
30.1	Frosterley, The Frosterley Inn	14245	402960	536927	Post Medieval - AD1541 to AD1899	Inn
31.1	Rookhope, Storfield Burn	14298	394165	542320	Post Medieval - AD1541 to AD1899	A former Inn
32.1	Swinhope Moor, Swinhope Head House	14312	389549	534256	Post Medieval - AD1541 to AD1899	A former Inn
33.1	Wolsingham, Black Bull	14373	407606	537214	Post Medieval - AD1541 to AD1899	A former Inn, now a Public House
34.1	St. John's Chapel, Golden Lion Inn	14450	388543	537905	Post Medieval - AD1541 to AD1899	Inn
35.1	Stanhope, The Pack Horse Inn	14455	399670	539116	Post Medieval - AD1541 to AD1899	Inn
36.1	Stanhope, Bonny Moor Hen	14457	399692	539157	Post Medieval - AD1541 to AD1899	Inn
37.1	Rookhope, The Rookhope Inn	14471	393843	542868	Post Medieval - AD1541 to AD1899	Inn

MARKETS AND FAIRS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Barnard Castle	13480	405032	516327	Post Medieval - AD1541 to AD1899	Market Cross or Buttermarket
2.1	Tow Law	14324	412072	539067	Post Medieval - AD1541 to AD1899	Cattle Market Auction Building
3.1	St. John's Chapel	4228	388600	537800	Modern - AD1900 to present	Cattle Market Building Complex
4.1	Bishope Auckland	9570	421107	530084	Medieval - AD1066 to AD1540	Site of Market
5.1	Sedgefield	351	435500	528800	Medieval - AD1066 to AD1540	Market Cross
6.1	Darlington	1506	428890	514480	Post Medieval - AD1541 to AD1899	Market Cross
7.1	Stanhope	2320	399660	539170	Post Medieval - AD1541 to AD1899	Market Cross
8.1	Bishope Auckland	1406	421120	530100	Medieval - AD1066 to AD1540	Market House
9.1	Barnard Castle	2005	405100	516400	Post Medieval - AD1541 to AD1899	C18 Butter Market

MEDIEVAL SETTLEMENTS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Cold Hesledon	6	441600	546700	Medieval - AD1066 to AD1540	Deserted Medieval Village
2.1	Hesledon, Hulam	65	443000	536000	Medieval - AD1066 to AD1540	Deserted Medieval Village
3.1	Peterlee, Yoden	76	443240	541720	Medieval - AD1066 to AD1540	Deserted Medieval Village
4.1	Wingate, White Hurworth	156	440000	534000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
5.1	Wingaet, Black Hurworth	159	441000	534000	Medieval - AD1066 to AD1540	Deserted Medieval Village
6.1	Sheraton	160	444160	534980	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
7.1	Castle Eden	165	442700	538700	Medieval - AD1066 to AD1540	Deserted Medieval Village
8.1	Sedgefield, Embleton	174	442000	529700	Medieval - AD1066 to AD1540	Deserted Medieval Village
9.1	Sadberge, West Newbiggin	206	43550	518500	Medieval - AD1066 to AD1540	Deserted Medieval Village
10.1	Sadberge, East Newbiggin	208	436600	518900	Medieval - AD1066 to AD1540	Deserted Medieval Village

MEDIEVAL SETTLEMENTS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
11.1	Middleton St. George, West Hartburn	209	435600	514110	Medieval - AD1066 to AD1540	Deserted Medieval Village
12.1	Sedgefiel, Low Swainston	268	441800	528400	Medieval - AD1066 to AD1540	Deserted Medieval Village
12.2	Sedgefiel, Low Swainston	268	441956	529291	Medieval - AD1066 to AD1540	Deserted Medieval Village
13.1	Middleton St. George, Neasham	273	432000	510000	Medieval - AD1066 to AD1540	Deserted Medieval Village
14.1	Brampton, Skerningham	306	430730	518510	Medieval - AD1066 to AD1540	Deserted Medieval Village
15.1	Little Burdon	311	432930	516500	Medieval - AD1066 to AD1540	Deserted Medieval Village
16.1	Sadberge	315	434310	517130	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
17.1	Preston-le-Skerne	317	430500	524070	Medieval - AD1066 to AD1540	Deserted Medieval Village
18.1	Newton Ketton	320	431300	520400	Medieval - AD1066 to AD1540	Deserted Medieval Village
19.1	Preston-le-Skerne, High Grindon	325	432250	524200	Medieval - AD1066 to AD1540	Deserted Medieval Village
20.1	Great Stainton	327	433660	521950	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
21.1	Little Stainton	331	434770	520260	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
22.1	Preston-le-Skerne, Elstob	332	434000	523800	Medieval - AD1066 to AD1540	Deserted Medieval Village
23.1	Foxton	336	436300	524800	Medieval - AD1066 to AD1540	Deserted Medieval Village
24.1	Bradbury, Nunstainton	340	431700	529200	Medieval - AD1066 to AD1540	Deserted Medieval Village
25.1	Sedgefield, Hardwick	346	434600	529400	Medieval - AD1066 to AD1540	Deserted Medieval Village
26.1	Sedgefield, Shotton	353	436600	525400	Medieval - AD1066 to AD1540	Deserted Medieval Village
27.1	Sedgefield, Layton	354	437800	527000	Medieval - AD1066 to AD1540	Deserted Medieval Village
28.1	Sedgefiel, Old Acres	355	439100	528500	Medieval - AD1066 to AD1540	Deserted Medieval Village
29.1	Cassop, Old Cassop	1077	433670	539540	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
30.1	Kelloe, Church Kelloe	1079	434000	536000	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
31.1	Kelloe, Town Kelloe	1084	435000	536000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
32.1	Trimdon Colliery, Hurworth Bryan	1088	439000	535000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
33.1	Cornforth, Thrislington	1104	430700	533300	Medieval - AD1066 to AD1540	Deserted Medieval Village
34.1	Kelloe, Garmondsway (Moor?)	1129	434150	534800	Medieval - AD1066 to AD1540	Deserted Medieval Village
35.1	Pittington, Hallgarth	1140	432900	543400	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
36.1	Shadforth, Ludworth	1145	435600	541400	Medieval - AD1066 to AD1540	Deserted Medieval Village
37.1	Kimblesworth	1284	425000	546000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
38.1	Chilton, Great Chilton	1330	429900	530300	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
39.1	Middlestone	1331	425300	531200	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
40.1	Chilton, Little Chilton	1341	429500	531300	Medieval - AD1066 to AD1540	Deserted Medieval Village
41.1	Tursdale	1366	429300	537100	Medieval - AD1066 to AD1540	Deserted Medieval Village
42.1	Brancepeth, Stockley	1372	421900	537400	Medieval - AD1066 to AD1540	Deserted Medieval Village
43.1	Binchester	1432	420000	531000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
44.1	Byers Green, Whitworth	1434	423500	534700	Medieval - AD1066 to AD1540	Deserted Medieval Village
45.1	Bishop Auckland, Newton Cap	1437	420200	530500	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
46.1	Heighington, New Biggin	1447	422090	523950	Medieval - AD1066 to AD1540	Deserted Medieval Village
47.1	Shildon, Thickley	1448	422200	524900	Medieval - AD1066 to AD1540	Deserted Medieval Village
48.1	Houghton-le-Side	1449	422300	521800	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
49.1	Shildon, West Thickley	1462	421400	525100	Medieval - AD1066 to AD1540	Deserted Medieval Village
50.1	South Church, Henknowle (and Coppycrooks)	1464	421400	528200	Medieval - AD1066 to AD1540	Deserted Medieval Village
51.1	Shildon, East Thickley	1481	424100	525700	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
52.1	Eldon, Old Eldon	1482	424500	527400	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village

MEDIEVAL SETTLEMENTS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
53.1	Heworth, Preston-le-Skerne	1484	429300	523300	Medieval - AD1066 to AD1540	Deserted Medieval Village
54.1	Aycliffe, Middridge Old Towns	1485	425800	524400	Medieval - AD1066 to AD1540	Deserted Medieval Village
55.1	Aycliffe, School Aycliffe	1486	426000	523000	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
56.1	Coatham Mundeville	1487	428500	520500	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
57.1	Newton Aycliffe, Woodham	1497	428800	526700	Medieval - AD1066 to AD1540	Deserted Medieval Village
58.1	Archdeacon Newton	1524	425500	517200	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
59.1	Whessoe	1529	427600	517800	Medieval - AD1066 to AD1540	Deserted Medieval Village
60.1	Summerhouse	1547	420000	519000	Medieval - AD1066 to AD1540	Deserted Medieval Village
61.1	Denton	1558	422000	519000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
62.1	High Coniscliffe, Ulnaby	1561	422700	517100	Medieval - AD1066 to AD1540	Deserted Medieval Village
63.1	Walworth	1568	423200	519100	Medieval - AD1066 to AD1540	Deserted Medieval Village
64.1	Barforth	1593	416400	516200	Medieval - AD1066 to AD1540	Deserted Medieval Village
65.1	Headlam, Langton	1619	417200	519400	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
66.1	Gainford, Dyance	1627	419200	518100	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
67.1	Killerby	1628	419000	519000	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
68.1	Staindrop, Snotterton	1633	410000	519000	Medieval - AD1066 to AD1540	Deserted Medieval Village
69.1	Cleatlam	1635	412000	518700	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
69.2	Cleatlam	1635	412125	518750	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
70.1	Wycliffe, Thorpe in Wycliffe	1648	410400	514200	Medieval - AD1066 to AD1540	Deserted Medieval Village
71.1	Hutton Magna	1652	412600	512400	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
72.1	Wycliffe, Girlington	1653	412800	513800	Medieval - AD1066 to AD1540	Deserted Medieval Village
73.1	Hilton, Tofts	1662	417800	521500	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
74.1	Ingleton, Morton Tinmouth	1664	418700	521200	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
75.1	West Auckland, Lutterington Hall	1665	418800	524400	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
76.1	Bolam	1666	419800	522500	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
77.1	Staindrop, Shotton	1687	411000	522700	Medieval - AD1066 to AD1540	Deserted Medieval Village
78.1	Staindrop, Raby	1689	412900	522000	Medieval - AD1066 to AD1540	Deserted Medieval Village
79.1	Cockfield, Keverstone	1717	413900	522700	Medieval - AD1066 to AD1540	Deserted Medieval Village
80.1	Howden-le-Wear, Harperley	1761	412700	534600	Medieval - AD1066 to AD1540	Deserted Medieval Village
81.1	Wolsingham, Bradley	1790	410000	536000	Medieval - AD1066 to AD1540	Deserted Medieval Hamlet / Village
82.1	Wear Valley, Thornley	1799	411575	537190	Medieval - AD1066 to AD1540	Deserted Medieval Village
83.1	Crook, Woody Field	1801	414500	535000	Medieval - AD1066 to AD1540	Deserted Medieval Village
84.1	Esh Winning, 'Ivesley	1834	417700	541600	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
85.1	Esh Winning, West Rowley	1837	417600	542700	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
86.1	Lanchester, Newbiggin	1872	414800	547700	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
87.1	Delves, Knitsley	1873	411100	548700	Medieval - AD1066 to AD1540	Deserted Medieval Village
88.1	Lanchester, Colepike Hall	1876	414500	546000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
89.1	Hurbuck Cottages	1879	414800	548200	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
90.1	Greecroft, Greencroft Park	1885	416600	549200	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
91.1	Dipton, Collierley	1889	415300	554600	Medieval - AD1066 to AD1540	Deserted Medieval Village
92.1	Tantobie, Bursblades	1892	416900	553400	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
93.1	Crookhall	1898	412200	550700	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
94.1	Burnhopefield, Lintz	1921	416000	556000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
95.1	Greta Bridge, Rokeby	1930	408400	514400	Medieval - AD1066 to AD1540	Deserted Medieval Village

MEDIEVAL SETTLEMENTS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
96.1	Whorlton, Sledwich	1932	409300	515200	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
97.1	Barnard Castle, Westwick	1933	407100	515500	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
98.1	Brignall	1962	407200	512100	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
99.1	Greta Bridge, Mortham	1965	408700	514200	Medieval - AD1066 to AD1540	Deserted Medieval Village
100.1	Marwood, Knott Hill	1971	404000	519000	Medieval - AD1066 to AD1540	Deserted Medieval Village
101.1	Scargill, Rutherford	2006	403100	511900	Medieval - AD1066 to AD1540	Deserted Medieval Village
102.1	Holwick, Unthank	2084	392000	526200	Medieval - AD1066 to AD1540	Deserted Medieval Village
103.1	Bedburn, Hoppyland	2196	409700	532300	Medieval - AD1066 to AD1540	Deserted Medieval Village
104.1	Wolsingham, Newland and Fowleys	2209	404500	537500	Medieval - AD1066 to AD1540	Deserted Medieval Village
105.1	Edmundbyers, Pedham's Oak	3159	398600	548300	Medieval - AD1066 to AD1540	Deserted Medieval Village
106.1	Brignall	3201	407000	512000	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
107.1	Coxhoe, East House	3261	433200	535700	Medieval - AD1066 to AD1540	Deserted Medieval Village
108.1	Thornley	3265	436000	538450	Medieval - AD1066 to AD1540	Deserted Medieval Village
109.1	Lartington	3488	401850	517700	Early Medieval - C5 to AD1066	Deserted / Shrunken Medieval Village
110.1	Hawthorn	3867	441900	545500	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
111.1	Cockfield, Gibbsneese	4195	409700	523750	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
112.1	Butterknowle, Potters Cross	4196	409000	526000	Medieval - AD1066 to AD1540	Deserted Medieval Village
112.2	Butterknowle, Potters Cross	4196	410000	526000	Medieval - AD1066 to AD1540	Deserted Medieval Village
113.1	Staindrop, Alwent	7711	413500	519800	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
114.1	Barnard Castle, Barford	7712	410000	517000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
115.1	Sedgefield, Brierton	7713	447610	529970	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
116.1	Seaham, Old Burdon	7714	438200	550500	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
117.1	Sedgefield, Claxton	7715	447500	528000	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
118.1	Darlington, Elton	7716	440310	517400	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
119.1	Thornleyn Hart	7717	446990	534990	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
120.1	Seaton, Slingley	7718	438063	548067	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
121.1	Shraton, Low Throston	7719	449000	533200	Medieval - AD1066 to AD1540	Deserted Medieval Village
122.1	Sheraton, High Throston	7720	448490	533690	Medieval - AD1066 to AD1540	Deserted Medieval Village
123.1	Kelloe	7721	435568	536872	Medieval - AD1066 to AD1540	Deserted Medieval Village(?)
124.1	Pontop	7805	414500	553200	Medieval - AD1066 to AD1540	Deserted Medieval Village
125.1	Cassop, Trillesdon	7806	434000	538000	Medieval - AD1066 to AD1540	Deserted Medieval Village
126.1	Pelaw, Chester-le-Street	7807	427500	552600	Medieval - AD1066 to AD1540	Deserted Medieval Village
127.1	Esh Winning, Castle Steads	7808	417900	542600	Medieval - AD1066 to AD1540	Deserted Medieval Village
128.1	Cornsay	7809	414500	543500	Medieval - AD1066 to AD1540	Deserted Medieval Village
129.1	Esh Winning, Flass Hall	7810	420651	542532	Medieval - AD1066 to AD1540	Deserted Medieval Village
130.1	Roughside (Ruffside)	7811	399400	551800	Medieval - AD1066 to AD1540	Deserted Medieval Village
131.1	Newton Hall, Newton by Durham	7812	428000	545000	Medieval - AD1066 to AD1540	Deserted Medieval Village
132.1	Newton Aycliffe, Ricknall	7813	429000	523700	Medieval - AD1066 to AD1540	Deserted Medieval Village
133.1	Haswell	7814	436300	544000	Medieval - AD1066 to AD1540	Deserted Medieval Village
134.1	Langley Park, Langley	7815	421000	546700	Medieval - AD1066 to AD1540	Deserted Medieval Village
135.1	Lumley Castle, Little Lumley	7816	??	??	Medieval - AD1066 to AD1540	Deserted Medieval Village (Map Ref. given - NZ28805090)
136.1	Butterknowle, Softley	7817	409300	526800	Medieval - AD1066 to AD1540	Deserted Medieval Village

MEDIEVAL SETTLEMENTS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
137.1	Low Middleton	7818	436500	510900	Medieval - AD1066 to AD1540	Deserted Medieval Village
138.1	Middleton One Row, West Middleton	7819	436500	517700	Medieval - AD1066 to AD1540	Deserted Medieval Village
139.1	Darlington, Morton Palms	7820	432900	513700	Medieval - AD1066 to AD1540	Deserted Medieval Village
140.1	Chester-le-Street, Picktree	7821	428000	553100	Medieval - AD1066 to AD1540	Deserted Medieval Village
141.1	, Peterlee, Little Eden	7822	442900	542100	Medieval - AD1066 to AD1540	Deserted Medieval Village
142.1	Sherburn, South Sherburn	7823	431700	540800	Medieval - AD1066 to AD1540	Deserted Medieval Village
143.1	Streatlam	7824	408300	520400	Medieval - AD1066 to AD1540	Deserted Medieval Village
144.1	Grange Villa, Tribley	7825	424100	551000	Medieval - AD1066 to AD1540	Deserted Medieval Village
145.1	Peterlee, Eden Lane	8050	443200	541710	Medieval - AD1066 to AD1540	Deserted Medieval Village
146.1	Low Dinsdale, Whessoe	8070	427676	517805	Medieval - AD1066 to AD1540	Deserted Medieval Village
146.2	Low Dinsdale, Whessoe	8070	434554	511015	Medieval - AD1066 to AD1540	Deserted Medieval Village
147.1	Shildon, East Throckley	9014	424428	525703	Medieval - AD1066 to AD1540	Deserted Medieval Village
148.1	Durham, Relley Farm (Rilli)	9394	425253	541729	Medieval - AD1066 to AD1540	Deserted Medieval Village
149.1	Hesledon, Monk Hesledon	151	445500	537100	Medieval - AD1066 to AD1540	Shrunken Medieval Village
150.1	Sedgefield, Buttterwick	2412	438500	529800	Medieval - AD1066 to AD1540	Deserted / Shrunken Medieval Village
151.1	Scargill	5608	405100	510540	Medieval - AD1066 to AD1540	Shrunken Medieval Village / Manor Complex
151.2	Scargill	5608	405180	510670	Medieval - AD1066 to AD1540	Shrunken Medieval Village / Manor Complex
151.3	Scargill	5608	405240	510810	Medieval - AD1066 to AD1540	Shrunken Medieval Village / Manor Complex
151.4	Scargill	5608	405360	510670	Medieval - AD1066 to AD1540	Shrunken Medieval Village / Manor Complex
152.1	Wingate, Old Wingate	5804	437540	537570	Medieval - AD1066 to AD1540	Shrunken Medieval Village
153.1	Haswell, High Haswell	6616	436630	543710	Medieval - AD1066 to AD1540	Shrunken Medieval Village
154.1	Lunedale, Thringart	15804	393051	522900	Medieval - AD1066 to AD1540	Shrunken Medieval Village
155.1	Lunedale, Laithkirk	15805	395520	524063	Medieval - AD1066 to AD1540	Shrunken Medieval Village
156.1	Wackerfield	15866	415304	522512	Medieval - AD1066 to AD1540	Shrunken Medieval Village
157.1	Muggleswick	2235	406000	547000	Medieval - AD1066 to AD1540	C13 Vaccary

ROMAN DATA

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Piercebridge	1538	420670	516310	Roman - AD70 to C5	Aqueduct
1.2	Piercebridge	1538	420870	516030	Roman - AD70 to C5	Aqueduct
2.1	Castleside	1869	410730	547370	Roman - AD70 to C5	Aqueduct
3.1	Lanchester	1870	411650	546040	Roman - AD70 to C5	Aqueduct
3.2	Lanchester	1870	414063	546712	Roman - AD70 to C5	Aqueduct
3.3	Lanchester	1870	414452	546752	Roman - AD70 to C5	Aqueduct
3.4	Lanchester	1870	415094	546462	Roman - AD70 to C5	Aqueduct
4.1	Lanchester	1871	412430	546330	Roman - AD70 to C5	Aqueduct
4.2	Lanchester	1871	412980	546140	Roman - AD70 to C5	Aqueduct
5.1	Lanchester	3044	412220	546940	Roman - AD70 to C5	Aqueduct
5.2	Lanchester	3044	414800	546000	Roman - AD70 to C5	Aqueduct

ROMAN DATA (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
5.3	Lanchester	3044	415000	546200	Roman - AD70 to C5	Aqueduct
6.1	Bowes, Deepdale	3392	393000	514000	Roman - AD70 to C5	Aqueduct
7.1	Bowes, Deepdale	3393	394000	514000	Roman - AD70 to C5	Aqueduct
8.1	Bowes, Deepdale	3394	395000	514000	Roman - AD70 to C5	Aqueduct
9.1	Bowes, Deepdale	3395	396000	514000	Roman - AD70 to C5	Aqueduct
10.1	Bowes, Deepdale	3396	397000	514000	Roman - AD70 to C5	Aqueduct
11.1	Lanchester	6317	415940	546890	Roman - AD70 to C5	Fort
12.1	Chester-le-Street, Highfield Hospital	3096	427301	552398	Roman - AD70 to C5	Ard
13.1	Forest-in-Teesdale, High Force Quarry	3098	388000	529000	Roman - AD70 to C5	Round House
14.1	Barningham Moor, Arndale Beck Boundary	5722	403820	506590	Roman - AD70 to C5	Romano-British Linear Boundary
15.1	Eastgate, Stanhope Park	7007	396386	538221	Roman - AD70 to C5	Boundary
16.1	Eastgate, Rose Hill Boundary	7142	393951	539109	Roman - AD70 to C5	Boundary Ditch(?)
17.1	Eastgate, Rose Hill Boundary	7205	393869	538646	Roman - AD70 to C5	Boundary Ditch
18.1	Eastgate, Old Park Farm Boundary	7314	393880	538254	Roman - AD70 to C5	Lynchet with Hut Platform
19.1	Eastgate, Old Park Farm Boundary	7318	392974	538324	Roman - AD70 to C5	Bank turning into Lynchet
20.1	Eastgate, Old Park Farm Boundary	7320	392909	538258	Roman - AD70 to C5	Bank turning into Lynchet
20.2	Eastgate, Old Park Farm Boundary	7320	392938	538320	Roman - AD70 to C5	Bank turning into Lynchet
21.1	Eastgate, Old Park Farm Boundary	7326	392745	538301	Roman - AD70 to C5	Bank and then Lynchet
22.1	Eastgate, Old Park Farm Boundary	7327	392878	538248	Roman - AD70 to C5	Bank
23.1	Eastgate, 'Heights Quarry Boundary	7345	393189	538293	Roman - AD70 to C5	Stonu Bank
23.2	Eastgate, 'Heights Quarry Boundary	7345	393220	538257	Roman - AD70 to C5	Stonu Bank
24.1	Eastgate, 'Heights Quarry Boundary	7346	393207	538283	Roman - AD70 to C5	Short Lynchet
25.1	Eastgate, 'Heights Quarry Boundary	7369	392940	538098	Roman - AD70 to C5	Bank
26.1	Eastgate, 'Heights Quarry Boundary	7373	392630	538394	Roman - AD70 to C5	Boundary / Routeway
26.2	Eastgate, 'Heights Quarry Boundary	7373	392635	538490	Roman - AD70 to C5	Boundary / Routeway
27.1	Eastgate, Old Park Farm Boundary	7388	392334	538185	Roman - AD70 to C5	Boundary
28.1	Eastgate, Old Park Farm Boundary	7389	392330	538223	Roman - AD70 to C5	Boundary
29.1	Westgate, Spring House	7601	390792	538628	Roman - AD70 to C5	Boundary
30.1	Eastgate, 'Hunterley Well	7625	394124	538447	Roman - AD70 to C5	Boundary Ditch and Bank
31.1	Eastgate, 'Stanhope Park	9180	396043	538021	Roman - AD70 to C5	Stony Bank
32.1	Faverdale Business Park, Darlington	9756	427801	517555	Roman - AD70 to C5	Enclosures, Boundaries and Ditches
33.1	Eastgate, 'Stanhope Park	9761	396254	538143	Roman - AD70 to C5	Lynchet
34.1	Eastgate, 'Stanhope Park	9764	395999	537885	Roman - AD70 to C5	Boundary
35.1	Bowes, Bowes Village	5634	399158	513539	Roman - AD70 to C5	Probable Buildings
36.1	Binchester, Fort	1424	421110	531030	Roman - AD70 to C5	Extra Mural Building
37.1	Binchester, Fort	1428	421080	531210	Roman - AD70 to C5	Buildings (Christian?)
38.1	Satley	1831	411790	543230	Roman - AD70 to C5	Buildings
39.1	Binchester, Binchester Hall	8890	420900	531333	Roman - AD70 to C5	Building
40.1	Bradbury, Great Isle Farm	339	430320	526810	Roman - AD70 to C5	Canal(?)
41.1	Cornforth, Thrislington Hall	6325	430200	533400	Roman - AD70 to C5(?)	Alleged Canal
42.1	Mordon	6327	432700	526510	Roman - AD70 to C5(?)	Barge Basin(?)
43.1	Bishop Middleham, Holdforth Bridge	6328	434660	531390	Roman - AD70 to C5(?)	Barge Basin(?)

ROMAN DATA (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
44.1	Eastgate, Rose Hill	7214	393812	538737	Roman - AD70 to C5	A possible Scoop
45.1	Westgate, Old Park Farm	7381	392525	538297	Roman - AD70 to C5	Hut Platform
46.1	Westgagte, New Park Farm	7404	392623	538106	Roman - AD70 to C5	House Platform(?)
47.1	Westgagte, New Park Farm	7406	392506	538124	Roman - AD70 to C5	Hut Circle(?)
48.1	Wolsingham, Stanhope Park (Phase 2)	9419	??	??	Roman - AD70 to C5	Circular Platform
49.1	Wolsingham, Stanhope Park (Phase 2)	9496	??	??	Roman - AD70 to C5	Scoop(?)
50.1	Wolsingham, Stanhope Park (Phase 2)	9503	??	??	Roman - AD70 to C5	Earthwork
51.1	Wolsingham, Stanhope Park (Phase 2)	9504	??	??	Roman - AD70 to C5	Lynchet
52.1	Wolsingham, Stanhope Park (Phase 3)	9779	397302	538564	Roman - AD70 to C5	Earthwork
53.1	Piercebridge	1543	421000	516000	Roman - AD70 to C5	Earthwork
54.1	Eastgate, Old Park Farm	7329	392760	538092	Roman - AD70 to C5	Small Hollow
55.1	Eastgate, Old Park Farm	7331	392838	538173	Roman - AD70 to C5	Small Hollow
55.2	Eastgate, Old Park Farm	7331	392868	538163	Roman - AD70 to C5	Small Hollow
56.1	Eastgate, Old Park Farm	7335	392901	538210	Roman - AD70 to C5	Part of Field System(?)
57.1	Eastgate, Heights Quarry	7347	393180	538312	Roman - AD70 to C5	Scoop Platfrom(?)
58.1	Eastgate, Heights Quarry	7349	393376	538321	Roman - AD70 to C5	Mining Shaft(?)
59.1	Westgate, Warden Hill	7628	391858	538047	Roman - AD70 to C5	Earthwork
60.1	Eastgate, 'Stanhope Park (Phase 3)	9796	??	??	Roman - AD70 to C5	Earthwork
61.1	Bowes, Jock House	3921	402000	513000	Roman - AD70 to C5	Earthwork, possible Ladder Style Settlement
62.1	Bowes, East Mellwaters	8036	396810	526040	Roman - AD70 to C5	Earthwork Banks and Settlement Scoops(?)
63.1	Westgate, Peat Hill Brow	7636	390896	538689	Roman - AD70 to C5	Enclosed Field System
64.1	Holwick, Blaebeck Foot	431	387460	527950	Roman - AD70 to C5	Settlement
65.1	Forest-in-Teesdale, Force Garth Pasture	5153	386490	528360	Roman - AD70 to C5	Settlement
66.1	Holwick, Keld Green Smithy	5162	388950	526790	Roman - AD70 to C5	Settlement
67.1	Holwick, Hind Gate	5276	390180	526920	Roman - AD70 to C5	Farmstead
68.1	Westgate, Brecken Hill	7083	391399	538280	Roman - AD70 to C5	Enclosure
69.1	Westgate, Brecken Hill	7096	391206	538549	Roman - AD70 to C5	Boundary
70.1	Heights QuarryEastgate,	7244	393032	538766	Roman - AD70 to C5	Large Enclosure
71.1	Westgate, New Park Farm	7425	391931	538371	Roman - AD70 to C5	Scooped Enclosure
72.1	Westgate, New Park Farm	7433	39189	538426	Roman - AD70 to C5	Enclosure and Field System(?)
72.2	Westgate, New Park Farm	7433	391940	538389	Roman - AD70 to C5	Enclosure and Field System(?)
73.1	Westgate, Field Head	8666	391681	537641	Roman - AD70 to C5	Enclosure
74.1	Sedgefield	15877	435031	528907	Roman - AD70 to C5	Enclosure
75.1	Barningham Moor, High Band	5721	404300	507600	Roman - AD70 to C5	Enclosures
76.1	Bowes, Cow Close	15863	399712	514341	Roman - AD70 to C5	Temporary Camp
77.1	Durham City	1259	428920	541510	Roman - AD70 to C5	'Villa'
78.1	Mordon, Mordon North Farm	1638	432239	527082	Roman - AD70 to C5	Cropmark
79.1	High Force, East Forth Garth	5132	387830	528520	Roman - AD70 to C5	Settlement
80.1	Holwick, Crossthwaite Common	6511	392230	524950	Roman - AD70 to C5	Settlement
81.1	Holwick, Crossthwaite Common	6512	392230	524950	Roman - AD70 to C5	Settlement / Field System
82.1	Westgate, Churchyard (at)	7033	390844	538210	Roman - AD70 to C5	Field Boundary
83.1	Westgate, Churchyard (at)	7035	390842	538188	Roman - AD70 to C5	Field Boundary

ROMAN DATA (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
84.1	Westgate, Churchyard (at)	7045	390839	538165	Roman - AD70 to C5	Field Boundary
85.1	Westgate, Churchyard (at)	7058	390897	538215	Roman - AD70 to C5	Field Boundary
86.1	Westgate, Churchyard (at)	7061	390860	538233	Roman - AD70 to C5	Field Boundary
87.1	Westgate, Scutterhill Bank Field	7063	390810	538474	Roman - AD70 to C5	Lynchet
88.1	Westgate, Warden Hill	7066	391648	538169	Roman - AD70 to C5	Field Boundary
89.1	Westgate, Warden Hill	7067	391648	538140	Roman - AD70 to C5	Hut Platform(?)
90.1	Westgate, Spring House	7617	390755	538659	Roman - AD70 to C5	Earthwork Platform
91.1	Westgate, Spring House	7618	390696	538803	Roman - AD70 to C5	Boundary
92.1	Holwick, Blaebeck Foot	431	387460	527950	Roman - AD70 to C5	Settlement Enclosure
93.1	High Force, East Forth Garth	5132	387830	528520	Roman - AD70 to C5	Settlement / Field System
94.1	Forest-in-Teesdale, Force Garth Pasture	5153	386490	528360	Roman - AD70 to C5	Settlement Enclosures
95.1	Holwick, Keld Green Smithy	5162	388950	526790	Roman - AD70 to C5	Settlement
96.1	Holwick, Hind Gate	5276	390180	526920	Roman - AD70 to C5	Farmstead
97.1	Eastgate, Heights Quarry	7242	393133	538536	Roman - AD70 to C5	Hut Circle
98.1	Eastgate, Heights Quarry	7243	393091	538798	Roman - AD70 to C5	Hut Circle
99.1	Eastgate, New Park Farm	7309	392470	538083	Roman - AD70 to C5	Hut Circle (Scoop?)
100.1	Eastgate, New Park Farm	7310	392470	538083	Roman - AD70 to C5	Hut Circle Scoop
101.1	Westgate, Chester House	7508	391388	538580	Roman - AD70 to C5	Settlement
102.1	Westgate, Warden Hill	7520	391587	538250	Roman - AD70 to C5	Hut Circle Platform
103.1	Westgate, Scutterhill Incline	7541	391101	538573	Roman - AD70 to C5	Hut Circle Platform
104.1	Bollihope Common, Brian's Fold	2338	397600	535200	Roman - AD70 to C5	Settlement
105.1	Forest-in-Teesdale, High Force Quarry	3096	388000	529000	Roman - AD70 to C5	Settlement
106.1	Forest-in-Teesdale, Force Garth Pasture	3107	387600	528300	Roman - AD70 to C5	Settlement
107.1	Sedgefield	4582	434959	529069	Roman - AD70 to C5	Settlement
108.1	Forest-in-Teesdale, Force Garth Pasture	5153	386490	528360	Roman - AD70 to C5	Settlement
109.1	Holwick, Keld Green Smithy	5162	388950	526790	Roman - AD70 to C5	Settlement
110.1	Holwick, Hind Gate	5276	390180	526920	Roman - AD70 to C5	Farmstead
111.1	Barningham Moor	5719	405720	507700	Roman - AD70 to C5	Settlement
111.1	Barningham Moor	5719	405900	507700	Roman - AD70 to C5	Settlement
111.3	Barningham Moor	5719	406130	507650	Roman - AD70 to C5	Settlement
112.1	Holwick, Crossthwaite Common	6511	392230	524950	Roman - AD70 to C5	Settlement
113.1	Holwick, Crossthwaite Common	6512	392230	524950	Roman - AD70 to C5	Settlement / Field Ssytem
114.1	Eastgate, Portland Lodge	7163	394594	538660	Roman - AD70 to C5	Settlement
115.1	Eastgate, Rose Hill Farm	7171	393607	538760	Roman - AD70 to C5	Settlement
116.1	Eastgate, Old Park Farm	7317	392688	538342	Roman - AD70 to C5	Settlement Scoop
117.1	Westgate, Field Stile	8199	391244	537445	Roman - AD70 to C5	Settlement Boundary
118.1	Marwood	9005	403659	519839	Roman - AD70 to C5	Settlement
119.1	Eastgate, Stanhope Park	9724	396947	537869	Roman - AD70 to C5	Settlement
120.1	Eastgate, Stanhope Park (Phase3)	9725	396000	530000	Roman - AD70 to C5	Settlement
121.1	Eastgate, Stanhope Park (Phase3)	9760	396254	538144	Roman - AD70 to C5	Settlement
122.1	Bowes, Mount Pleasant	3399	397100	513200	Roman - AD70 to C5	Signal Station(?)
123.1	Consett, Broom Hill	1894	411400	553200	Roman - AD70 to C5	Signal Station

ROMAN DATA (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
124.1	Bowes Moor	2040	392990	512490	Roman - AD70 to C5	Signal Station
125.1	Bowes Morr, Vale House	2510	394700	512800	Roman - AD70 to C5	Signal Station
126.1	Bowes Moor, Rey Cross	3400	390000	512400	Roman - AD70 to C5	Signal Station(?)
127.1	Binchester	1430	421100	531500	Roman - AD70 to C5	Vicus
128.1	Piercebridge	1537	421200	515700	Roman - AD70 to C5	Vicus
129.1	Greta Bridge	1928	408000	513000	Roman - AD70 to C5	Vicus
130.1	Bowes	2045	399200	513400	Roman - AD70 to C5	Vicus
131.1	Bowes, Meadow's Edge	3864	391000	513000	Roman - AD70 to C5	Vicus
132.1	Lanchester	6317	415940	546890	Roman - AD70 to C5	Vicus
133.1	Lanchester	6318	416050	546950	Roman - AD70 to C5	Vicus

WAGGON WAYS

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Auckland Park, Bishop Auckland	2946	423825	528781	Post Medieval - AD1541 to AD1899	Wagon Way
2.1	Middridge Colliery, Shildon	2956	424846	525276	Post Medieval - AD1541 to AD1899	Tram Way
2.1	Middridge Colliery, Shildon	2956	425019	526139	Post Medieval - AD1541 to AD1899	Tram Way
3.1	Chilton	2968	429031	531515	Post Medieval - AD1541 to AD1899	Wagon Way
4.1	Chilton	2969	428000	531000	Post Medieval - AD1541 to AD1899	Wagon Way
5.1	Westerton, Coundon	2974	424000	530000	Post Medieval - AD1541 to AD1899	Wagon Way (Track)
6.1	Coundon	2978	423000	530000	Post Medieval - AD1541 to AD1899	Wagon Way
7.1	Cassop	2979	435000	538000	Post Medieval - AD1541 to AD1899	Wagon Way
8.1	Cornforth	2983	432000	533000	Post Medieval - AD1541 to AD1899	Wagon Way
9.1	Bishop Middleham	2989	433000	532000	Post Medieval - AD1541 to AD1899	Wagon Way
10.1	Middleham, Bishop Middleham	2990	431000	532000	Post Medieval - AD1541 to AD1899	Wagon Way
11.1	Cassop Vale, Cassop	2999	432000	539000	Post Medieval - AD1541 to AD1899	Wagon Way (Tramway)
12.1	Cassop Vale, Cassop	3002	433000	538000	Post Medieval - AD1541 to AD1899	Wagon Way
13.1	East Hetton, Kelloe	3004	434000	537000	Post Medieval - AD1541 to AD1899	Wagon Way Route
14.1	Heugh Hall, Coxhoe	3008	432000	537000	Post Medieval - AD1541 to AD1899	Wagon Way
15.1	Crowtrees, Coxhoe	3009	432000	537000	Post Medieval - AD1541 to AD1899	Wagon Way Route
16.1	West Hetton, Coxhoe	3010	432000	537000	Post Medieval - AD1541 to AD1899	Wagon Way
17.1	Crowtrees, Coxhoe	3015	432000	536000	Post Medieval - AD1541 to AD1899	Wagon Way Route
18.1	Littletown	3021	433000	543000	Post Medieval - AD1541 to AD1899	Wagon Way
19.1	Sherburn Hill (Bank)	3022	433000	543000	Post Medieval - AD1541 to AD1899	Wagon Way Route
20.1	Throstle Nest, Lanchester	3038	415300	545100	Post Medieval - AD1541 to AD1899	Wagon Way (Site of)
20.2	Throstle Nest, Lanchester	3038	415300	545800	Post Medieval - AD1541 to AD1899	Wagon Way (Site of)
21.1	Sunniside	3128	413600	537800	Post Medieval - AD1541 to AD1899	Wagon Way
21.2	Sunniside	3128	413800	538300	Post Medieval - AD1541 to AD1899	Wagon Way
22.1	Crook	3129	415000	534900	Post Medieval - AD1541 to AD1899	Wagon Way

WAGGON WAYS (cont'd)

Series No.	Site Name	PRN	x	y	Period	Notes
22.2	Crook	3129	415800	534700	Post Medieval - AD1541 to AD1899	Wagon Way
23.1	Bishop Middleham	3657	432590	533140	Post Medieval - AD1541 to AD1899	Wagon Way Route
24.1	Thistle Flat Road, Crook	3699	415600	534800	Modern - AD1900 to present	Wagon Way
25.1	Haswell	6618	437330	542760	Post Medieval - AD1541 to AD1899	Wagon Way
26.1	Haswell	6627	436870	544170	Post Medieval - AD1541 to AD1899	Wagon Way Route(?)
27.1	Kepier Colliery, Gilesgate	7858	428973	542931	Post Medieval - AD1541 to AD1899	Wagon Way
28.1	Kepier Colliery, Belmont	7859	428973	542931	Post Medieval - AD1541 to AD1899	Wagon Way
29.1	Rookhope	7884	394001	542098	Post Medieval - AD1541 to AD1899	Wagon Way Route(?)
30.1	Eclipse Brickworks, Crook	8093	415930	535070	Post Medieval - AD1541 to AD1899	Wagon Way (and Railway?)
31.1	Hawthorn Quarry, Hawthorn	8309	435500	546300	Post Medieval - AD1541 to AD1899	Wagon Way
32.1	Pontop Pike	8352	414480	552180	Post Medieval - AD1541 to AD1899	Wagon Way
33.1	Pontop Pike	8353	414700	552450	Post Medieval - AD1541 to AD1899	Wagon Way
34.1	Leadgate	8367	414020	551810	Post Medieval - AD1541 to AD1899	Wagon Way (Site of)
35.1	Harelaw	8384	415600	552400	Post Medieval - AD1541 to AD1899	Wagon Way
36.1	Greentoft, Durhamhill Wood	8414	415010	550260	Post Medieval - AD1541 to AD1899	Wagon Way
37.1	Annfield Plain, S. of Greencroft	8421	415880	550630	Post Medieval - AD1541 to AD1899	Wagon Way
38.1	Tanfield, Causey Arch	11782	420126	555896	Post Medieval - AD1541 to AD1899	Wagon Way
39.1	Causey, Culvert, Arch and Retaining Walls	11823	420383	556055	Post Medieval - AD1541 to AD1899	Wagon Way
40.1	Ramshaw	15740	395258	546461	Post Medieval - AD1541 to AD1899	Wagon Way
41.1	Hedlehope, 'Tow Law	15832	411748	540083	Post Medieval - AD1541 to AD1899	Wagon Way (Site of)
42.1	Hedlehope, 'Tow Law	15835	411954	540195	Post Medieval - AD1541 to AD1899	Wagon Way (Site of?)
43.1	Hedlehope, 'Tow Law	15841	412141	540038	Post Medieval - AD1541 to AD1899	Wagon Way (Site of?)
44.1	Tow Law, Hedleyhope	15842	412198	540197	Post Medieval - AD1541 to AD1899	Wagon Way (Site of?)
45.1	Sunniside 'Park Wall North Mining Site	15885	414070	537265	Post Medieval - AD1541 to AD1899	Wagon Way (and Railway?)
46.1	Sunniside 'Park Wall North Mining Site	15886	414104	537599	Post Medieval - AD1541 to AD1899	Wagon Way

CIVIL WAR SITES

Series No.	Site Name	PRN	x	y	Period	Notes
1.1	Bishop Auckland, Bishop Aucland Castle	D1387	421300	530200	Post Medieval - AD1541 to AD1899	New house built on demolished Bishop's Palace
2.1	Barnard Castle	D2003	405150	517160	Post Medieval - AD1541 to AD1899	Civil War Earthworks(?)
3.1	Cockfield, Slaughter Close	D2024	409230	523500	Post Medieval - AD1541 to AD1899	Bodies of soldiers buried after the Battle of Raby Castle(?)
4.1	Bearpark	D4354	423400	543700	Post Medieval - AD1541 to AD1899	Priory destroyed during the Civil War
5.1	Piercebridge	D5859	421000	515500	Post Medieval - AD1541 to AD1899	Bridge destroyed during the Civil War
6.1	Heighington, Middridge Grange Farmhouse	D11123	424470	524631	Post Medieval - AD1541 to AD1899	Building garrisoned during the Civil War
7.1	Heighington	D11124	424522	524605	Post Medieval - AD1541 to AD1899	Loop Holed(?)' Wall, E. of Middridge Grange Farmhouse
8.1	Shincliffe, Sherburn Hospital Gatehouse	D12400	430774	541540	Post Medieval - AD1541 to AD1899	Buildings badly damaged during the Civil War

14.3 Appendix 3

14.3.1 Lizards Farm: Vertical Core from Dere Street Ditch Description

0 – 15 cm: top soil

15 – 25 cm: Mid/dark brown layer. Stones and dark fleck (coal?) inclusions

26 – 38 cm: Sandy, light yellow/brown layer

38 – 56 cm: Compacted sandy grey clay with black flecks

56 – 62 cm: Slightly sandier layer

63 – 64 cm: Sandy mid brown yellow layer

65 cm: heavy mid grey clay layer

Light clay sub soil

For a photograph of the core please see figure 12

14.4 *Appendix 4*

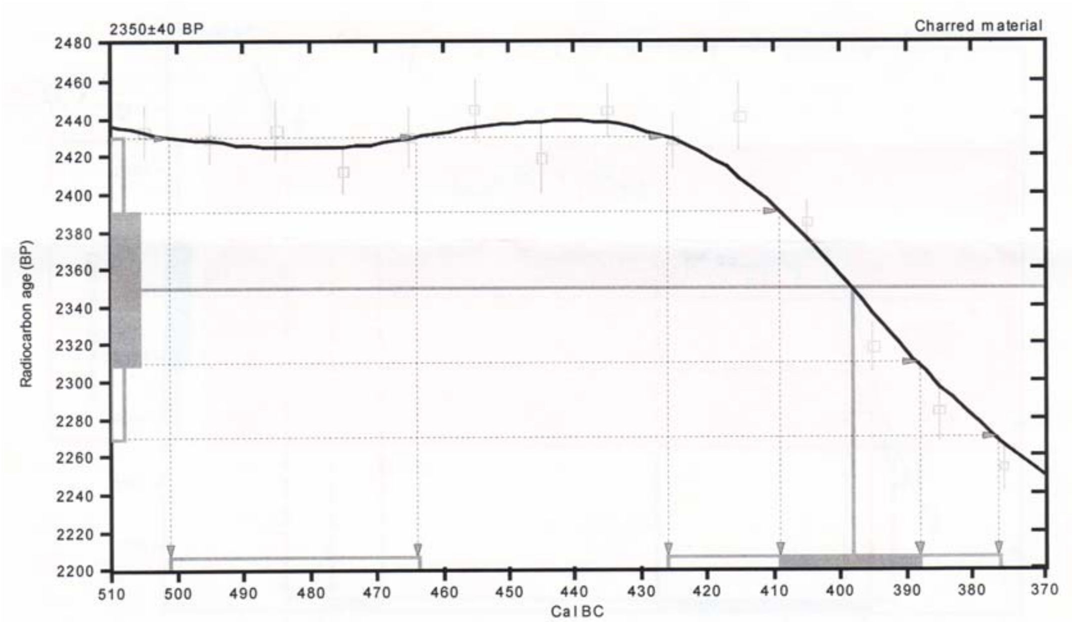
14.4.1 Calibration of Radiocarbon Age to Calendar Years

(Variables: C13/C12=-25.2:lab. mult=l)

Laboratory number: Beta-193987
Conventional radiocarbon age: 2350±40 BP
2 Sigma calibrated results Cal BC 500 to 460 (Cal BP 2450 to 2410) and
(95% probability): Cal BC 430 to 380 (Cal BP 2380 to 2330)

Intercept of radiocarbon age with calibration curve: CalBC 400 (CalBP 2350)

1 Sigma calibrated result: Cal BC 410 to 390 (Cal BP 2360 to 2340
(68% probability)



Result Obtained from:
Beta Analytic Radiocarbon Dating Laboratory
4985 S.W, 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com